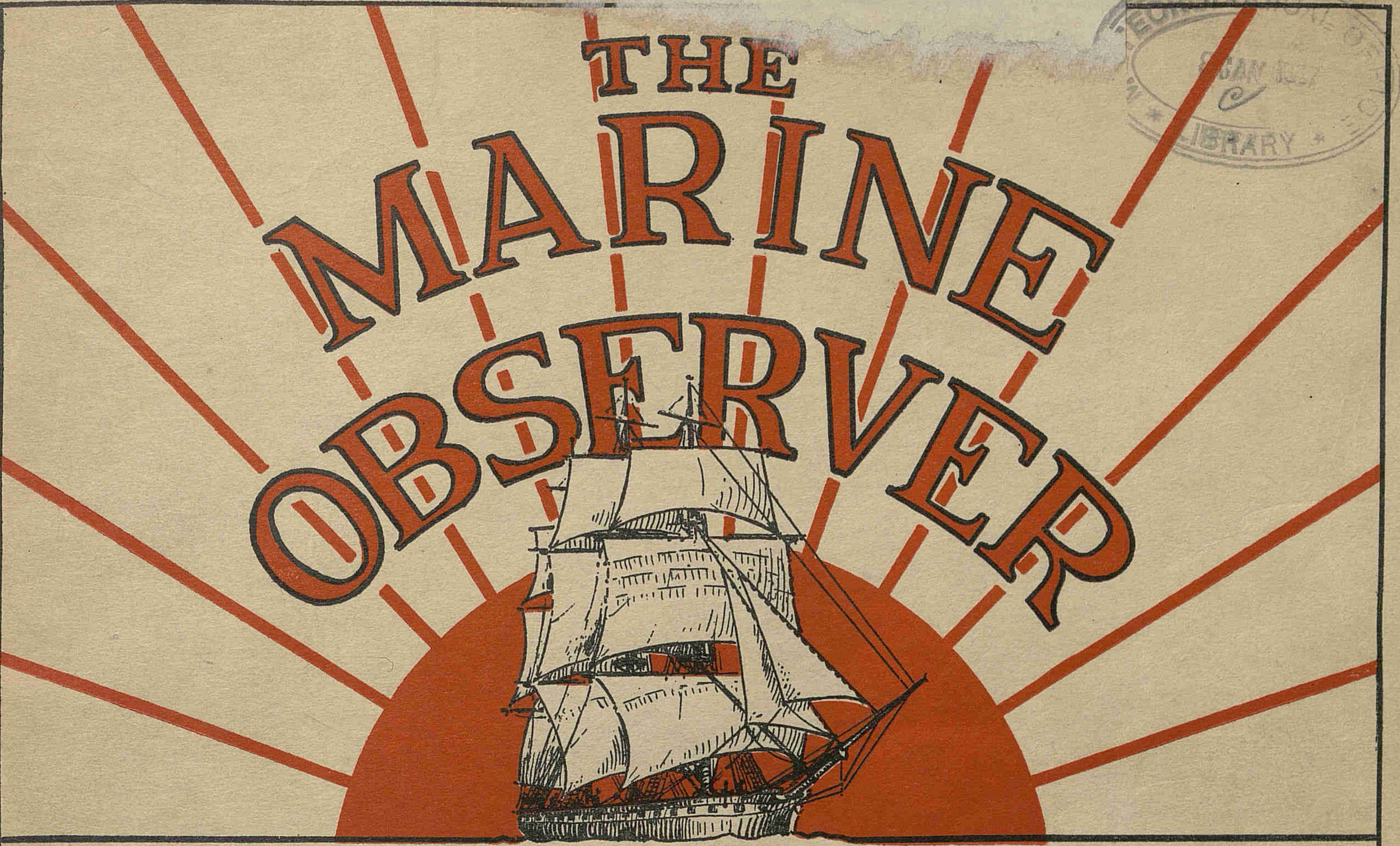
METEOROLOGICAL OFFICE
8 JAN 1937
LIBRARY

THE MARINE OBSERVER



Ship "Hotspur."
Capt. H. Toynbee

Admiral·R·Fitzroy· CB. RN.
·1854 — 1865·

Lieut·C·W·Baillie· RN·
·1888 — 1899·

Captain·H·Toynbee·
·1867 — 1888·

Captain·
M·Campbell·Hepworth·
·1899 — 1919· CB·RD·RNR·

VOL. XIV
No. 125

JANUARY
1937

PUBLISHED BY THE AUTHORITY
OF THE
METEOROLOGICAL COMMITTEE
AIR MINISTRY — LONDON
THE REVIEW OF THE MARINE DIVISION
IN CO-OPERATION WITH
VOLUNTARY MARINE OBSERVERS

Crown Copyright Reserved

LONDON

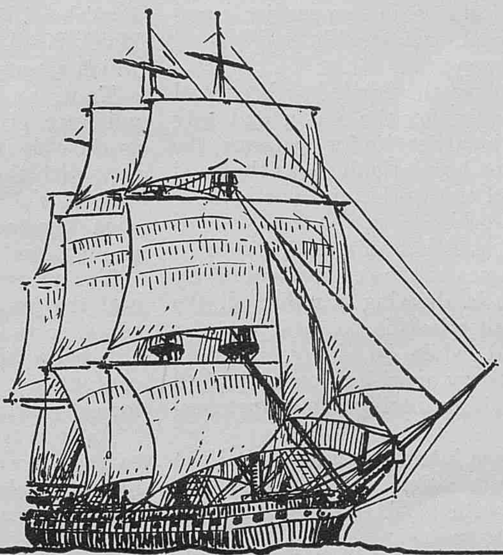
Published by H.M. Stationery Office
Quarterly. Price 4s. 0d. net
Monthly Supplement, 6d. net.
Annual Subscription, 21s. 0d. post free
(including monthly supplements)

Madupades

CAPTAIN L.A. BROOKE SMITH, RD, RNR., MARINE SUPERINTENDENT.

·C·H·W·

COPY FOR OFFICIAL USE.



Vol. XIV, No. 125. THE MARINE OBSERVER JANUARY 1937.

TABLE OF PRINCIPAL CONTENTS

PAGE.

The Marine Observer, 1937 2

The Marine Observers' Log :—

January, February and March 3

Captain H. F. David, R.D., R.N.R., by one of his Officers ... 14

The Extraction and Compilation of Marine Meteorological Data by Mechanical Methods, by H. T. Smith 16

A Brief History of the Royal Naval Reserve, by Commander M. Cresswell, R.N.R. 21

Comparison of the Severity of the Weather in the North Atlantic during the last six Winters, by Captain L. A. Brooke Smith, R.N.R. 25

Southern Ice Reports :—

January, February and March, 1936 27

Marine Meteorology and Safe Navigation 34

Wireless Weather Signals :—

Ships, Wireless Weather Signals 36

Wireless Stations Detailed to receive Routine Coded Weather Reports from " A Selected Ships " 40

PAGE.

Wireless Weather Signals—*continued.*

Wireless Stations Detailed to intercept Routine Coded Weather Reports from " B Selected Ships " 42

International Ships' Wireless Weather Telegraphy Code ... 44

Code Tables 45

Personnel :—

Captain D. Nicoll, Appointment 48

Captain C. E. Mumford }
Captain Joseph Ross } Retirement 48

Commodore Sir E. T. Britten, R.D., R.N.R. }
Captain C. E. Homan }
Captain A. J. Hosken } Obituary 48
Captain H. A. J. Kershaw }
Captain J. MacMahon, R.D., R.N.R. }

Lithographic illustrations after page 48 :—

Ships' Wireless Weather Signals, Chart of the World.

Currents in the Eastern Portion of the South Pacific :—

November, December and January.

Ice Chart of the Southern Hemisphere :—

January, February and March.

THE MARINE OBSERVER 1937.

We hope that 1937 may be the most successful in this work of the British Merchant Navy that there has ever been.

By success we mean to include that unity in sea-service upon which, under the good providence of God, the wealth, safety and strength of the British Empire chiefly depend.

To quote the Poet Laureate—"Whatever the earth has been and the air may become to us, at present we live by the sea"; and only a few weeks ago, in his address at the National Service for Seafarers, the Lord Bishop of Bristol brought home to us how valuable was the good influence of British seamen in all parts of the world, and particularly at this critical time in the affairs of the world.

THE MARINE OBSERVER has striven to foster that unity in sea service; and the fleet list, giving as it does the names of the corps of voluntary marine observers, has played some part in drawing together all the officers of the merchant navy who specialize in this voluntary service of meteorology to aid navigation; and while so doing, assisting aviation and all the other services of every maritime country, and indeed some non-maritime countries, requiring intelligence of meteorological conditions at sea.

Ever since the Selected Ship system was internationalized, and the British Selected Ship system for communication was established in 1930, masters of all British ships fitted with W.T. have been invited to carry on the service where and when necessary.

The advantage of personal instruction or advice to the officers of Selected Ships, by the Port Meteorological Officers and Merchant Navy Agents, has produced such good results that this advice and instruction is now being made available to other British ships, that is ships which are not in the fleet list in THE MARINE OBSERVER.

To work one great system world wide, advice by personal contact by experienced sea officers—who have received special instruction, and who are regularly advised from the Marine Division where the results of all the work are being constantly examined—is of great value.

On 1st October, 1936, the service of Merchant Navy Agents visiting British ships which are particularly desirable for supplementing the Selected Ship service was commenced. This work takes time, but it will ensure in the course of time that there are a large number of British ships whose commanders, officers, and W.T. operators have had initial instruction by British Port Meteorological Officers or Merchant Navy Agents in the conduct of the work which is specified in Article 35 of the Convention for Safety of Life at Sea; and who can be relied upon to carry on the service where and when necessary.

The question of when necessary will often occur. That must be largely a matter of judgment; and judgment in this should improve as the methods of forecasting weather which have been developed at sea, and made known through the medium of this Journal, become more widely known. That is to say, one who understands the construction of the weather chart knows the distribution of weather reports desirable, and, being experienced in the difficulties of wireless communication, will temper the natural desire of the forecaster for more observations with that moderation which produces a sound balance.

In the Eastern North Atlantic all will be assisted by the guidance which is given by the roll calls made by the Marine Division through Portishead Radio for "A" Selected Ships; and by Valentia Radio and Malin Head Radio for "B" Selected Ships and those British Ships which are supplementary to the service.

Thus, as in the early stages of the Selected Ship service, when guidance given by the roll call through Portishead very soon had world-wide influence towards regulating the service, so it is now hoped that with the personal contact of Merchant Navy Agents and the roll calls of Valentia and Malin Head, this extended service will not only soon become smooth and efficient, but well regulated by British shipmasters themselves in all parts of the world.

The accommodation of the Marine Division has just been improved, and the temporary increase of staff previously announced has taken place, so that data extraction to make up arrears right back to 1855 will be in full swing during 1937, with prospects of commencing the computation of averages and the construction of new ocean meteorological charts looming not too far ahead.

As it is a good many years since the mechanical system of data extraction was explained, we are publishing an article upon the subject in this number.

The past work done since the present system of charting currents was established in 1924, with THE MARINE OBSERVER, is making itself so felt that there is a great incentive to produce an atlas of currents for the South Pacific; and during the year the eastern portion of the South Pacific will be dealt with, and the appropriate Admiralty Pilots accordingly revised.

The Marine Observers' Log is our greatest hope, and we wish to give every encouragement to the use of the space in the meteorological log and in the ships' record of synchronized weather observations, for additional remarks.

In this number will be found a number of such remarks, with charts and sketches of interest. Amongst them is a chart indicating differences in the magnetic variation of the compass recently observed in the Southern Indian Ocean from that indicated on the Admiralty variation chart; and other evidence of the variation being different from that charted was published in the Marine Observers' Log in the October, 1936, number. The Hydrographer of the Navy has indicated his appreciation of the observation of British regular observing ships, and in 1937 the Admiralty Variation Chart is to be published incorporating information supplied by British Merchant Ships.

The world-wide observation of the British corps of voluntary marine observers, and their work in the whole interest of the sea service, is becoming more and more useful, and is greatly appreciated.

We wish to thank all those who do this work at sea, and we wish a very happy New Year to all our readers.

MARINE SUPERINTENDENT.

London,
14th December, 1936.

The Marine Observers' Log

January, February and March

It is hoped that these pages will be filled each quarter with a selection of the contributions of Mariners in manuscript, or remarks from the Logs and Records of regular Marine Observers.
Responsibility for statements rests with the Contributor.

MAGNETIC VARIATION IN THE SOUTHERN INDIAN OCEAN.

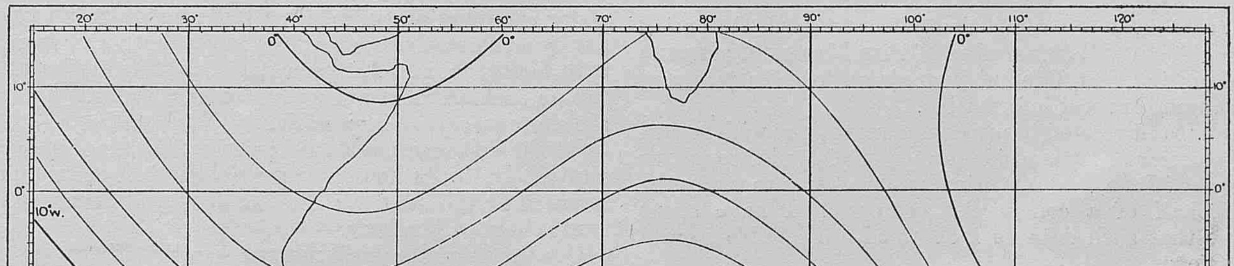
THE following observations are contributed by S.S. *Westmoreland*, Captain E. R. KEMP. Observing Officer, Lieut. C. B. CATHIE, R.N.R.

This chart of magnetic variation in the Indian Ocean shows that experienced by *Westmoreland* compared with that on Admiralty Chart No. 3776 of the year 1932.

This is compiled from the following observations :—

6th–11th March, 1936. Steering on the Composite Great Circle track indicated on the Chart from Capetown to Fremantle, the normal deviation of the ship's compass being 2° E., the deviation decreased to

Magnetic Variation—Indian Ocean, 1936.



20°
30°
40°
50°
60°
70°
80°
90°
100°
110°
120°
10°
0°
10°
20°
30°
40°
50°
0°
0°
0°
10°W.
10°W.
20°W.
20°W.
20°W.
30°W.
30°W.
40°W.
40°W.
Durban
Cape Town
Homeward Track
Fremantle
0°
Outward composite great circle track
10°W.
20°W.
30°W.
40°W.
30°W.
40°W.

Solid lines indicate Isogonic Lines as depicted on Admiralty Chart No. 3776, 1932.
Pecked lines indicate Isogonic Lines as experienced.

Nil in Longitude 50° E., increased to 4° W. in Longitude 68° E. and returned to normal in Longitude 95° E.

15th–25th May, 1936. On the homeward run from Fremantle to Durban, normal deviation being 3° W., the deviation commenced to increase in Longitude 99° E., reaching a maximum of 10° W. in Longitude 66° E. and then slowly decreasing to normal in Longitude 36° E.

Of the two sets of observations, the former is the more reliable since on the same voyage last year precisely similar deviations were found to occur and in between these two passages a new compass card has been shipped and corrected by a licensed Adjuster.

Note.—We are authorized by the Hydrographer of the Navy to say that considerable changes are taking place in the values of the magnetic variation in the Southern Indian Ocean and this area is likely to be one of the first to be visited by the R.R.S. *Research* when she commences her investigation of terrestrial magnetism at sea.

Reports from other sources confirm in general the experience of the *Westmoreland* and such information as is available has been included in the compilation for the quinquennial issue of the Admiralty variation charts of the world which will be published early in 1937. The values for the magnetic variation determined by *Westmoreland* should not be accepted unreservedly as there is reason to believe that the changes have not been so large as indicated and this is particularly the case north of the 30th parallel of S. latitude.

THE ROLLERS AT ASCENSION ISLAND

In the South Atlantic.

By Mr. Richard E. Parry.

The information contained regarding the rollers at both Ascension and St. Helena in the May, 1930, number of The Marine Observer is meagre but interesting, but I found your Atlantic gales tables in the January, 1936, number most informative.

You may possibly be interested in my own observations with regard to the rollers at Ascension. I was resident upon the island throughout April, May and part of June, and my primary object was to study the rollers, etc., on behalf of a commercial company. I have spent 25 years at sea, so that such data as I obtained are reliable from a seaman's point of view.

Three forms of rollers affect Ascension, the North-East, the South-West, and a combination of the two. They are not seasonal, any of them may, and do, occur at any time of the year, but the first, the North-East, are much more frequent during our winter months, from November to May, both months inclusive, and the South-West come along during the winter months of the Southern Hemisphere, from May to November, again both months inclusive.

The proportion of season to off-season occurrences for the North-East rollers is seven to one, and for the South-West rollers, five to one.

The foregoing is arrived at from a study of data observed by members of the Eastern Telegraph Cable Company's staff at Ascension over a period of years, 1923 to 1936 and seems to point to the truth of the generally accepted theory that the rollers are caused by gales in the North and South Atlantic Oceans respectively.

A combination of both North-East and South-West rollers at the same time is a rare occurrence, most fortunately, for then, the cross sea raised is especially dangerous and it is at such times that most damage has been caused.

The South-West rollers seriously affect part of the south coast, the whole of the west coast, and part of the north coast of the island, roughly the coast line from N.N.E. true, round through W. true, to W.S.W. to seaward, and but moderately affect the other parts. The North-East rollers, on the other hand, seriously affect the whole of the north coast only, from Boatswain Bird Island on the east as far west as Pyramid Rock, and but slightly affect the west coast. They do not affect the south and east coasts at all, apparently they are there "killed" by the prevailing South-East trade wind.

The only settlement on the island, Georgetown, on the west coast, is seriously affected by the South-West rollers only, the North-East rollers cause but a slight swell there, which is never big enough to affect trade.

I personally saw the South-West rollers coming in at Clarence Bay on the west coast, where the settlement of Georgetown is situated, on the 25th April, on the 13th May and on the 2nd June of this year (1936) and the following information holds good for each occurrence. The rollers came in from the westward, having followed the land round, and were first observed at 9 a.m., noon, and 2 a.m. (moonlight) respectively, in the form of a slight swell. Very heavy bank of nimbus to westward on each occasion, low-lying, distant about ten miles, disappearing later. Wind S.E.2; Temp., air 87° F., sea 78° F.; Bar. 30.02 in. (mercury). The sea was calm. Variation from foregoing figures on the second and third occasion was negligible. The summit of the island, Green Mountain, I observed on the three occasions was exceptionally clear and looking near and I also noted that the sea was on each occasion exceptionally blue and exceptionally clear, a fact that was very patent to sea-eyes, and is of particular interest inasmuch as I had been informed that the sea becomes "muddy" when rollers are threatening, my experience was directly the reverse.

Approximately two hours after the swell was first observed it had "grown" to dangerous proportions. At the pier at Georgetown, landing could only be effected by skilled native boatmen, the boat could remain alongside the steps for half-minutes only. Three hours after the swell was first observed the rollers commenced to "break," and at four hours the rollers were coming in at full force. Each one was 5 ft. to 7 ft. high, with a breaking sea on top of that. Interval between the rollers was approximately half a minute, and the rate of motion was a hundred feet a minute.

These rollers broke upon reaching the 5-fathom line. This was my own experience. Other people give 9 fathoms, all agree there is no "sea" and therefore no danger from these rollers if the water is 10 fathoms deep. I however noted again and again there was no white in the roller until the 5-fathom line was reached, and further, that where the roller swept across a shoal patch on to deeper water than 5 fathoms again, it "died" at once, changing from a breaker to a swell.

Inside the 5-fathom line the rollers are terrifying, solid walls of water sweeping along, extremely dangerous to all small craft. They finally crash on the beaches in a huge smother of foam and spume and with terrific force. The pier at Georgetown is 19 ft. above sea level but on each occasion was swept by solid water. Communication with the shore was quite impossible.

On the first occasion the rollers lasted 18 hours, the second, two days, and the third, 30 hours, they reached their maximum at about four hours after the swell was first noticed and began to die down about twelve hours afterwards.

One fact I particularly noticed was that there was a distinct lull in the "run" of the rollers every seventh. Others have noticed these lulls, in fact, advantage is sometimes taken of them to secure craft, etc., but there is no agreement as to when these lulls occur. My own observation was definitely and decidedly that a lull of from two to five minutes takes place after every seventh roller, an interesting fact which takes a lot of explaining. (I successfully launched a dinghy five times through the surf at North-East Bay in May while sounding the Bay by counting the seas and launching immediately the seventh had "broken," and was twice swamped and had to swim for it by neglecting to do so!)

In brief, the rollers at Ascension give a little warning, not very much I fear, and to be on the safe side no deep-sea craft should anchor inside the 10-fathom line and landing parties should always exercise the utmost caution and keep their eyes open.

CURRENT.

Straits of Jubal.

The following account of current experienced in the Straits of Jubal has been received from S.S. *Carthage*, Captain H. M. Jack.

"I think that attention might be drawn with advantage to an abnormally strong current experienced by S.S. *Carthage* on 1st February, 1936, in the Straits of Jubal, when on a passage from Aden to Suez. All bearings are True, and the times given are Egyptian Standard Time.

At 5.24 p.m., when Shadwan Island Lighthouse bore N. 80° W. 6.4 miles, a course N. 44° W. was set to pass 2 miles N.E. of Ashrafi Lighthouse. Speed was 15.25 knots. A cross bearing at 6.22 p.m. showed the ship to have been set S. 81° E. 2.25 miles. The current was evidently setting through the Shadwan Channel and between the reefs. It continued to carry the ship in an E.N.E'ly direction at approximately the same rate until abeam of Ashrafi Light.

Between 5.24 p.m. and 6.22 p.m. a course of N. 39° W. was actually made good. At 6.22 p.m., when Bluff Point Light bore N. 68° W. 11.25 miles, course was altered to N. 54° W. to counteract the current. Between that time and 7.42 p.m. the course made was N. 47° W., the ship passing 2.5 miles off Ashrafi Light at 7.39 p.m.

High water at Suez was at 6.29 p.m. Low water at Ashrafi was at 6.31 p.m., so, from the note on Chart 2838, the tide might have been expected to be slack. This set seems worth while noting since, should a chance be taken when visibility is poor, as is not infrequently the case owing to dust storms, a ship might easily be set very near to the Shag Rock and the reef to the northward where soundings would give little warning of danger. The maximum drift noted was at the rate of 3.6 knots."

CURRENT.

Caribbean Sea.

The following is an extract from the Meteorological Record of S.S. *Forsdale*, Captain D. Christie, Colon to Curaçao. Observer, Mr. A. Warren, 3rd Officer.

"29th March, 1936, at 0400 G.M.T., en route from Colon to Curaçao, experienced an abnormal current or rip between Farallon Sucio and Pt. Manzanillo. Frequent cross bearings were taken between beam bearing and the vessel was found to have been set 303° at a rate of about 6 knots. Wind W.S.W., force 3.

Position of ship, Latitude 9° 48′ N., Longitude 79° 27′ W."

PACK ICE OF ROSS SEA.

The following observations have been received from R.R.S. *Discovery II*, Captain L. C. Hill, O.B.E. Observing Officer, Mr. R. Walker, 1st Officer.

A number of vessels have, during the last 100 years, penetrated the Ross Sea as far as the Ross Ice Barrier in 78° 30′ South Latitude.

The ice conditions vary from year to year, but experience has shown that a vessel standing South on the Meridian of 180° in the middle of February has a good chance of an ice-free passage right up to the Barrier.

The accompanying chart shows the track of R.R.S. *Discovery II*, the passage through the pack ice being shown by a pecked line.

The first pack ice encountered was at 0749 G.M.T., 8th January, 1936, in Latitude 66° 48′ S., Longitude 178° 51′ W. The usual indication of pack ice—that is, low oily swell, no wind, and an abundance of bird life—had prevailed for two hours. This pack was very loose and formed of small floes very much broken up. The gaps of open water trended away to the eastward until 1600, when the vessel was able to make due south. Up to this time light airs prevailed and no movement of the floes was noticed.

0400 9th January, 1936.

Wind freshened from south to force 3 and leads began to open up rapidly, so that good progress was made to the south. The vessel was making a general southerly course, sometimes east and sometimes west of 178° W. Meridian, until 71° South was reached.

1600 10th January, 1936.

Latitude 71° 20′ S., Longitude 178° 00′ W., headway became more difficult and only a few miles were made each watch. The floes were more tightly packed, and also larger in area and steeper, although still with openings. The wind had fallen away to calm.

0830 11th January, 1936.

Latitude 71° 38′ S., vessel moored to an ice floe awaiting improved conditions. Light airs and calms prevailed on 11th and 12th and no progress was made.

On the 12th a large floe was inspected by the air pilot with a view to taking off in the "Moth" aircraft on a reconnaissance flight for open water. It was however found impracticable.

A very large tabular berg had been in sight for two days. This berg must have been at least 12 miles long.

A light S.E. wind sprang up on the 12th and a few miles were made to the S.W. where an area of open water permitted the "Moth" seaplane to take off.

The plane reported fairly open leads to the south, though no large expanse of open water could be seen.

With a wind force 3, southing was made at an increasing rate.

0130 14th January, 1936.

As no signs of open water were visible, the "Moth" was again launched.

Leads of increasing area were reported to the south but no large expanse of open water.

Progress was now improved although the floes became very steep, like a low barrier of 10 ft. high.

0330 14th January, 1936.

Strong appearance of open water to south.

1450 14th January, 1936.

Vessel cleared pack ice Latitude 73° 19′ S., Longitude 179° 50′ E., and proceeded in open sea to the Ross Ice Barrier.

0600 16th January, 1936.

The blink of the Ross Ice Barrier was seen, distance 35 miles.

The Barrier was made a few miles to the west of the Bay of Whales and vessel then cruised along the Barrier to the eastward. The Bay of Whales was made without difficulty, clear fine weather.

Soundings taken with Echo machines along the Barrier were never less than 277 fathoms and in the Bay of Whales a sounding of 360 fathoms was obtained.

A considerable amount of sea ice still remained fast in the Bay—ice which had to be crossed on foot in order to reach "Little America."

Vessel lay for two days, 16th and 17th, off the edge of bay ice. No change in either barrier or sea ice was noticed during this period.

A good fix was obtained in the Bay of Whales which revealed no change in position of the Barrier since last visited a year ago.

18th & 19th January, 1936.

Vessel completed a short triangular cruise to westward, returning to the Bay of Whales 1735 20th January, 1936.

During this short absence from the Bay of Whales, at least two miles of the bay ice had broken out and passed to the north, whilst several crevasses had appeared in the lower slopes of the barrier around the bay.

This was probably due to the prevalence of southerly winds during this period.

1244 22nd January, 1936.

Vessel finally left Bay of Whales where the ice was breaking out rapidly, the course set was to the N.W. to Latitude 75° 00′ S., Longitude 179° 20′ E., and then S.W. towards Ross Island.

0305 25th January, 1936.

Mt. Erebus was observed at a distance of about 68 miles, C. Crozier was standing out clearly and course was altered for it.

On closing the Cape to two miles distance, the Barrier was found as described by earlier navigators linking up to C. Crozier.

One small berg only was seen aground off the Cape.

A party landed from the ship and inspected the Adelie penguin rookery and also a small record post, probably erected by Captain Scott's party, which must have stood for at least 20 years.

26th January, 1936.

Vessel steered along north side of Ross Island towards McMurdo Sound, but in Latitude 77° 11′ S., Longitude 168° 00′ W., before reaching Bird Island, pack ice was met which extended to the western horizon.

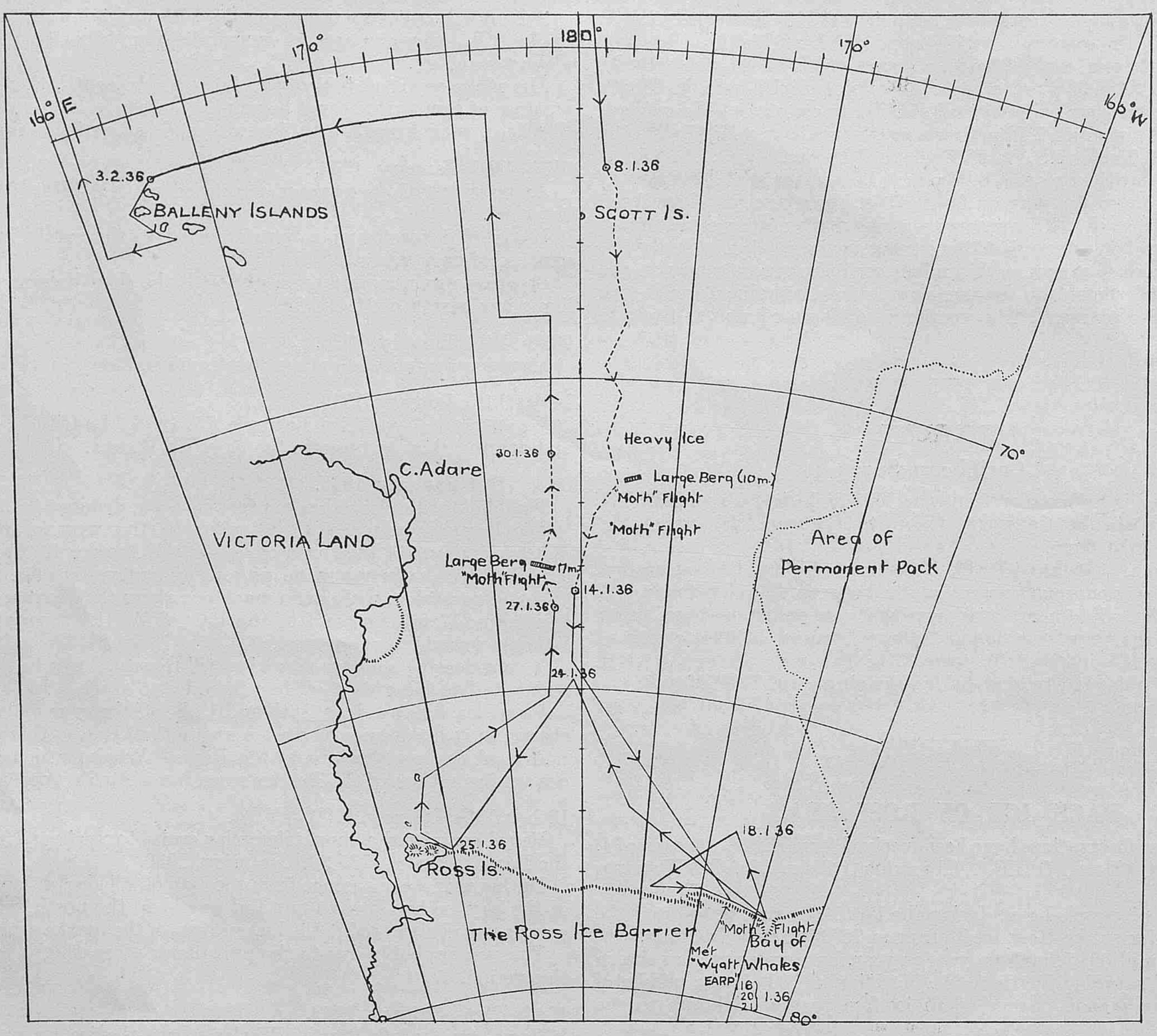
Mt. Terror was visible most of the time but Mt. Erebus was clouded over.

Vessel now made to the north towards Franklin Island in open water.

On closing the island to one mile, pack ice was observed surrounding the island and extending in all directions from S.W.—N., being free to the east.

Course was now set for Meridian of 178° E. and 74° S., from which position it was considered a passage north would possibly be ice free. However, after an ice free passage as far as Latitude 73° 37.6′ S., Longitude 178° 42′ E., pack ice was encountered.

Track of R.R.S. "Discovery II" to and from Bay of Whales—January, 1936.


180°
170°
160° E
170°
160° W
70°
80°
3.2.36
BALLENY ISLANDS
8.1.36
SCOTT IS.
Heavy Ice
Large Berg (10m.)
"Moth" Flight
"Moth" Flight
C. Adare
30.1.36
VICTORIA LAND
Area of Permanent Pack
Large Berg 17m.
"Moth" Flight
14.1.36
27.1.36
24.1.36
18.1.36
25.1.36
Ross Is.
The Ross Ice Barrier
"Moth" Flight
Bay of Whales
Met "Wyatt EARP"
16 20 21 1.36

- - - - *Pecked line indicates passage through pack ice.*

——— *Continuous line indicates passage through sea free of ice except for bergs.*

27th January, 1936.

Vessel skirted pack to the N.W. and finally entered pack heading north at 1200, 27th January, 1936.

The pack was fairly open and good progress made, although with some westing, until 2130, 27th January, Latitude 73° 77′ S., Longitude 177° 41.8′ W., when vessel came on a large patch of open water to leeward of a very large tabular berg. The berg's face lay W.N.W.—E.S.E. and each end was tried for favourable conditions, but both proved to be packed up. The "Moth" plane was launched and flew the length of the berg, attaining 1000 ft. Large open water was reported to N.E. This berg was estimated to be 17 miles long, a completely flat typical Barrier berg.

A smaller berg of a distinctly different type lay three miles to leeward of this large tabular berg. This small berg had the appearance more of a true glacier berg. Its blue colouring was most marked and the top appeared very rugged and hummocked. This rather suggested an eastward drift from one of the great glaciers of Victoria Land.

Later on the same day, 0515, 28th January, 1936, Latitude 72° 55.3′ S., Longitude 177° 40.1′ W., the plane again took off, reporting pack with many openings visible as far as visibility permitted.

Fair progress was then made until 0000, 30th January, 1936, Latitude 71° 26.2′ S., Longitude 178° 23.6′ E., when progress became easier and vessel finally cleared pack at 0400, 30th January, 1936, in Latitude 71° 05.6′ S., Longitude 178° 23.7′ E.

General.

Water Sky. It was our experience that even large areas of open water cannot be seen more than four miles, this applies in pack which consists of floes which are broken up but closely abutt each other.

Water sky may be identified more easily perhaps when in consolidated pack, but this was never met.

At a distance of two miles the pack often appeared close and not easy to penetrate, but on close approach the ice was found to be scattered with streams of water through which a vessel could make fair progress.

This absence of indication of water until close up was more pronounced when the floes were steep.

The large berg seen on 11th was taken for a patch of open water. Being completely flat with a wall face which was in the shadow, it presented a dull dark appearance in contrast to the white of the pack.

Wind of even force 2 has an immediate effect on the ice floes, leads open and close, permitting good progress to be made.

SOUTHERN OCEAN ICE.

The following is an extract from the Meteorological Log of R.R.S. *William Scoresby*, Captain C. R. V. Boothby, cruising in Antarctic Waters. Observer, Mr. R. C. Freaker, Chief Officer.

"The remarks refer to the ice sighted and reported during the last season (December, 1935, to March, 1936).

Bergs were much more numerous to the east of Longitude 80° E. than between there and the longitude of the Cape of Good Hope, except close to the land where large numbers of tabular bergs were seen in all parts visited, many probably grounded.

Between Latitude 60° S. and 64° S. and between Longitude 80° E. and 90° E. an exceptionally large number of small bergs were sighted at the end of January. Mostly very small and irregular and of all shapes and forms.

Of the several thousands of bergs sighted during the season the highest one measured was just over 300 ft. high. Any that appeared unusually high were measured if practicable. Extensive pack ice was encountered off the eastward end of Queen Mary Land between 95° E. and 105° E. in the early part of February. Towards the end of February the coast of MacRobertson Land was found to be almost entirely free of pack ice.

"The first and usually most definite signs of approach to pack ice were the presence of Antarctic and Snow petrels. Antarctic petrels were usually sighted when within about 100 miles of pack ice, and Snow petrels when much closer. On rare occasions these birds were seen at greater distances from the pack ice."

THE SUMMER CLIMATE OF THAT PORTION OF THE SOUTHERN OCEAN LYING TO THE SOUTH OF THE 56th PARALLEL AND BETWEEN THE MERIDIAN OF GREENWICH AND THAT OF 105° E.

The following is an extract from the Meteorological Log of R.R.S. *William Scoresby*, Captain C. R. V. Boothby, cruising in Antarctic Waters. Observer, Mr. R. C. Freaker, Chief Officer.

"As a result of two summer seasons (December to March inclusive) spent exclusively in the above region, it is thought that a few brief general remarks may be added as to climate.

In the open ocean away from the coast and the edge of the pack ice the most notable features of the climate during the summer months are :—The frequency and violence of gales, the high cloud amount and frequency of precipitation and the uniformity of temperature.

Westerly gales are most frequent around the 60th parallel, but to the south of Latitude 62° S. the majority blow from the eastward. These gales may last from a few hours up to two or three days and frequently come on with great suddenness and with little warning from the barometer.

The precipitation is mainly in the form of snow or sleet and is sometimes almost continuous for two or three days, a very common weather condition being an almost continuous, but very light, fall of fine snow with poor or moderate visibility and a clear sky visible overhead. Sometimes the fall of snow is so slight as to be almost imperceptible, and at other times there is sufficient snow drifting in the lower atmosphere to cause poor visibility, with blue sky or stars visible overhead.

One of the most remarkable features is the uniformity of temperature, which, away from the ice edge, rarely varies more than 3° F. or 4° F. throughout the greater part of the summer, remaining always in the neighbourhood of freezing point.

When the land is approached, i.e. the mainland of Antarctica, or in or near the edge of extensive areas of close pack, a great contrast in weather conditions is experienced, as then the sky is usually clear with exceptional visibility. In fact, if anywhere within about 50 miles of the coast, an arc of clear sky is usually visible in the direction of the land, although the remainder of the sky is heavily overcast. The temperature is usually lower and more variable, being affected by the direction of the wind. Close to the coast gales are more frequent than in the open sea and it is seldom that it is not blowing hard."

FROST SMOKE.

Ross Sea.

The following is an extract from the Meteorological Log of R.R.S. *Discovery II*, Captain L. C. Hill, O.B.E., Dunedin to Bay of Whales. Observer, Mr. R. Walker, 1st Officer.

"19.1.36, 0300 G.M.T. to 20.1.36, 0000 G.M.T., that is from Latitude 78° 12.0′ S., Longitude 173° 40.0′ W. to Latitude 78° 25.0′ S., Longitude 164° 39.5′ W., navigating along Ross Ice Barrier.

During above time frost smoke prevailed with varying intensity, at times it had the effect of reducing the visibility and obscuring horizon. It was first observed in brilliant sunshine on 19th as vessel closed the Ross Ice Barrier, rising from the water like steam.

The sun revealed minute ice crystals held in suspension in the clouds of frost smoke. The temperature of the sea during these observations ranged from 33.5° F. to 30.5° F., whilst the air temperature was never more than 16° F. and fell as low as 4° F, the barometer fell steadily from 991.0 mb. to 976 mb.

It would appear that the cold air immediately over the warm sea receives some of the heat from the latter, this increases its saturation point and moisture is absorbed, but the air above being so much colder, this moisture is almost immediately frozen. This may be an explanation of the presence of visible ice crystals."

THRUSHES.

St. George's Channel.

The following is an extract from the Meteorological Record of S.S. *Orduna*, Captain A. Ridyard, Liverpool to Biscay Ports. Observer, Mr. R. D. Eckford, 3rd Officer.

"During the night of 12th/13th March, 1936, in the St. George's Channel, south bound, we were visited by a flight of thrushes, perhaps migrant, apparently attracted by the lights about the ship. Several found their way through various open ports or doors into the interior.

At dawn a goodly number were observed fluttering here and there, and a few dead about the decks.

Passing Land's End the majority left, those in the interior finding their way out; one, however, remained and at 1900 was still in the dining saloon."

LARGE WAVES.

Spanish Coastal Waters.

The following is an extract from the Meteorological Record of S.S. *Madura*, Captain J. A. Wright, Marseilles to Gibraltar. Observer, Mr. A. W. Clarke, 2nd Officer.

"28th February, 1936, 0240 G.M.T., proceeding down the Spanish coast, from Marseilles towards the Gibraltar Straits, seven miles from the coast. Prevailing weather, strong west winds, moderate sea, moderate short swell, fine and clear. The vessel, whilst under the lee of Cape de Gata, completely sheltered from the wind and experiencing only a moderate short swell, was met on the starboard bow from a W.N.W. direction by four large waves in succession, which caused a violent pitching and the shipping of a great deal of water; the fourth and final large wave rolled right over the forecastle head and completely filled the forward well deck. Upon righting again, conditions were as before, spraying forward and pitching easily. When Cape de Gata bore 270°, half an hour later, the full force of the westerly wind was again felt.

Position of ship, Latitude 36° 40′ N., Longitude 2° 00′ W."

ST. PAUL'S ISLAND.

South Indian Ocean.

The following is an extract from the Meteorological Record of S.S. *Berwickshire*, Captain J. D. Matthews, Beira to Port Pirie. Observer, Mr. J. C. Robertson, 2nd Officer.

"15th January, 1936, at 5 p.m. A.T.S. Vessel made the north-west coast of St. Paul's Island, Latitude 38° 43′ S., Longitude 77° 31′ E., and course was altered, as on 9th February, 1933. Steamed round the west, south and east coasts as far as the entrance to Crater Lake, when course was resumed. Whistle was frequently sounded but no one on the island. No goats were seen on this occasion, the shores of Crater Lake, however, were covered with thousands of small white birds.

When approaching the entrance to the lake from the south-east, a good view of the provision depot was again obtained. Although the smaller huts appeared in good order, the largest, which on the last occasion appeared in excellent condition, had the middle part of the roof missing, but the rafters seemed intact.

A slight northerly set was experienced on both sides of the island, and frequent patches of kelp were encountered around the south coast only. Weather at the time was excellent, a gentle north-east breeze, with slight sea and south-west swell, with excellent visibility."

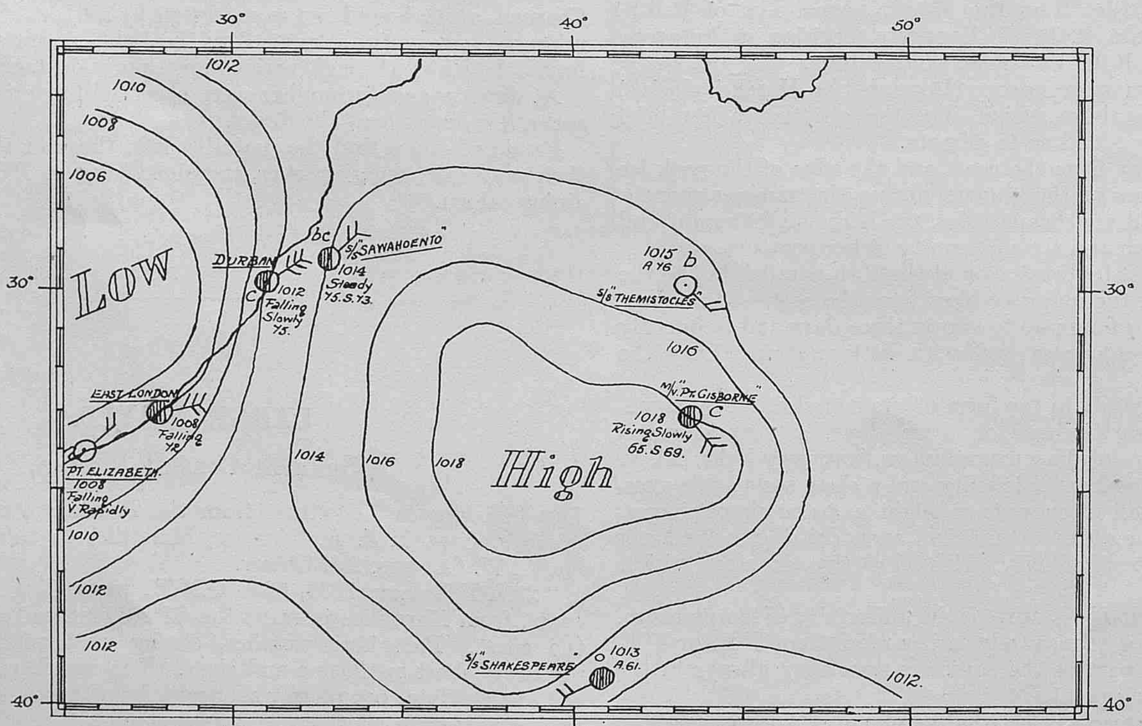
WEATHER FORECASTING AT SEA.

South African Waters.

M.V. *Port Gisborne*, Captain W. G. Higgs.
Observing Officer, Mr. H. B. Walker, 3rd Officer.

Weather Chart on 8th January 1936 M.V. "Port Gisborne"

At 0600. GMT (Ship Time 8·40.am)

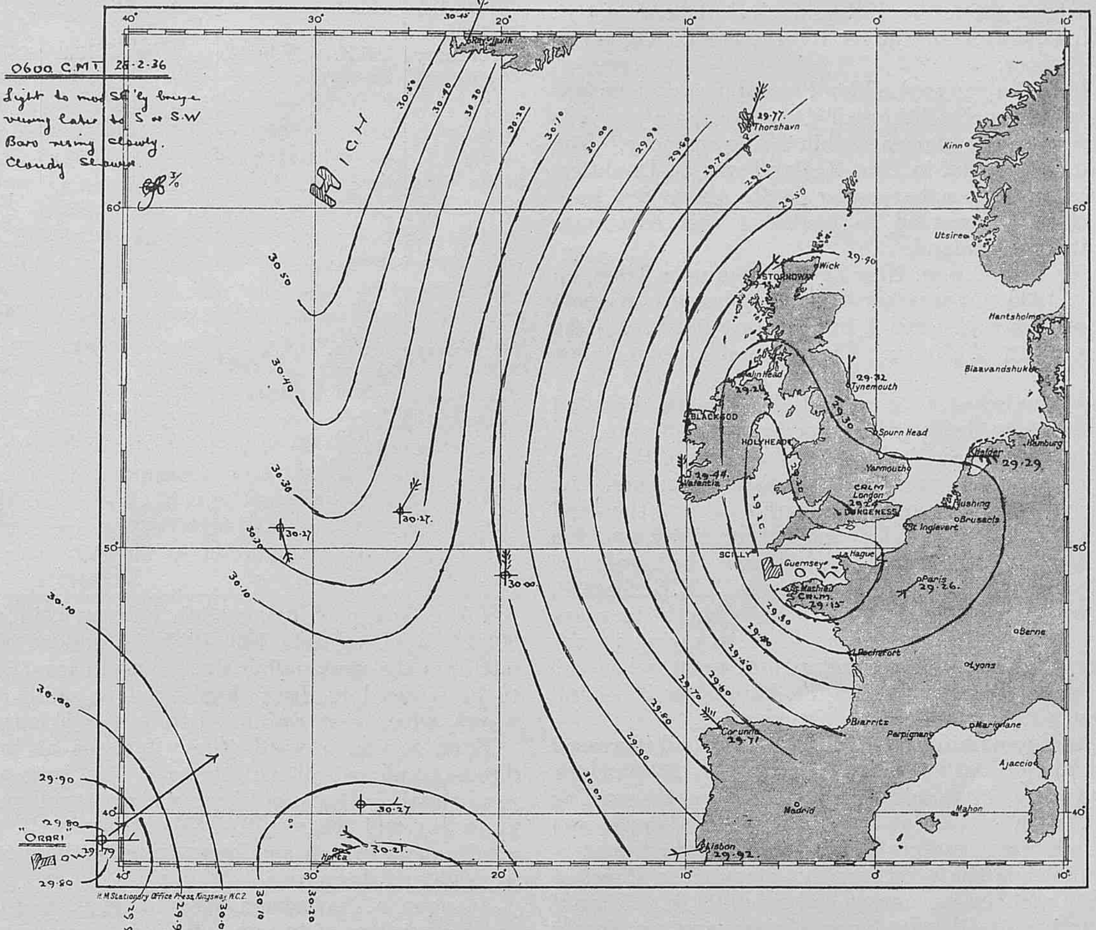

30°
40°
50°
1012
1010
1008
1006
LOW
30°
DURBAN
bc
S/S "SAWAHOENTO"
C
1012
Falling
Slowly
75.
1014
Steady
75.S.73.
1015
A 76
b
S/S "THEMISTOCLES"
30°
1016
EAST LONDON
1008
Falling
72
M/V. "PT. GISBORNE"
1018
Rising Slowly
65.S 69.
C
PT. ELIZABETH.
1008
Falling
V. Rapidly
1014
1016
1018
High
1010
1012
1012
S/S "SHAKESPEARE"
1013
A.61.
1012.
40°
40°
30°
40°
50°

General Statement. An intense Anti-cyclone extends from South Africa to Long 46° E, and a rather Deep depression is at present centred over Cape Colony which is moving South.

Forecast. Winds will back Ely to ENE and later tomorrow (9th) to North & NW, & freshening Barometer will continue to fall slowly throughout, but no immediate change in conditions expected.

Eastern North Atlantic.

M.V. *Orari*, Captain J. G. Almond. Observing Officer, Mr. C. J. Cordran.

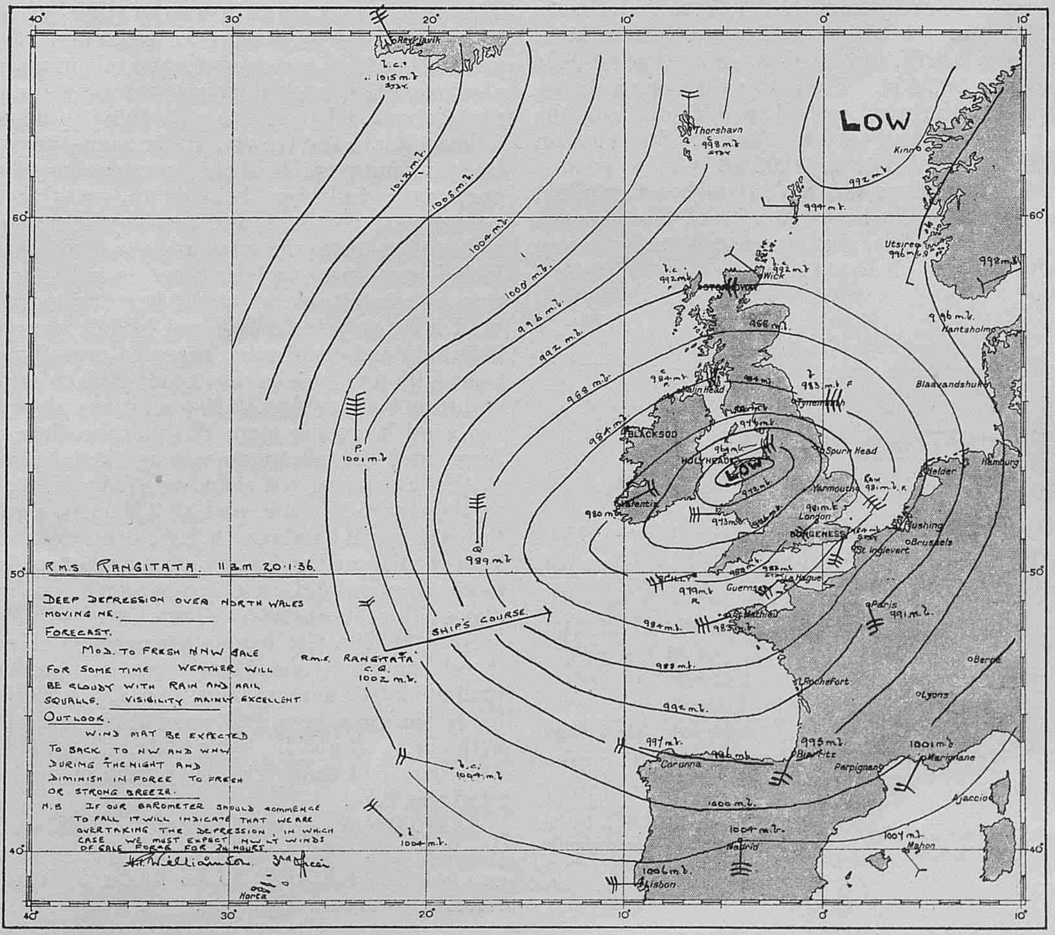


0600 G.M.T. 28-2-36

Light to mod SE'ly breeze veering later to S or S.W Baro rising slowly. Cloudy Showers

HIGH
LOW
"ORARI"
30.50
30.40
30.30
30.20
30.10
30.00
29.90
29.80
29.70
29.60
29.50
29.79
30.27
30.21
29.97
29.92
29.71
29.44
29.26
29.29
29.15
CALM
Reykjavik
Thorshavn
Kinn
Utsiree
Hantsholm
Blaavandshuk
Hamburg
Helder
Stornoway
Wick
Tynemouth
Malin Head
Blacksod
Holyhead
Spurn Head
Yarmouth
London
Dungeness
Valentia
Scilly
Guernsey
La Hague
St. Mathieu
Flushing
Brussels
St. Inglevert
Paris
Berne
Lyons
Rochefort
Biarritz
Perpignan
Marignane
Ajaccio
Mahon
Madrid
Coruña
Lisbon
Horta
H.M.Stationery Office Press, Kingsway W.C.2

R.M.S. *Rangitata*, Captain E. Holland. Observing Officer, Mr. H. P. Williamson, 3rd Officer.



RMS RANGITATA. 11 a.m 20·1·36.

DEEP DEPRESSION OVER NORTH WALES MOVING NE.

FORECAST.

MOD. TO FRESH NNW GALE FOR SOME TIME WEATHER WILL BE CLOUDY WITH RAIN AND HAIL SQUALLS. VISIBILITY MAINLY EXCELLENT

OUTLOOK.

WIND MAY BE EXPECTED TO BACK TO NW AND WNW DURING THE NIGHT AND DIMINISH IN FORCE TO FRESH OR STRONG BREEZE.

N.B IF OUR BAROMETER SHOULD COMMENCE TO FALL IT WILL INDICATE THAT WE ARE OVERTAKING THE DEPRESSION, IN WHICH CASE WE MUST EXPECT NW LT WINDS OF GALE FORCE FOR 24 HOURS.

H.P. Williamson. 3rd Officer

LOW
LOW
SHIP'S COURSE
R.M.S. RANGITATA
c.q.
1002 m.b.
P.
1001 m.b.
1015 m.b.
1012 m.b.
1008 m.b.
1004 m.b.
1000 m.b.
996 m.b.
992 m.b.
988 m.b.
984 m.b.
980 m.b.
989 m.b.
979 m.b.
983 m.b.
991 m.b.
993 m.b.
995 m.b.
997 m.b.
998 m.b.
1001 m.b.
1004 m.b.
1006 m.b.
1007 m.b.
Reykjavik
Thorshavn
Kinn
Utsiree
Hantsholm
Blaavandshuk
Hamburg
Helder
Stornoway
Wick
Tynemouth
Malin Head
Blacksod
Holyhead
Spurn Head
Yarmouth
London
Dungeness
Valentia
Guernsey
La Hague
St. Mathieu
Flushing
Brussels
St. Inglevert
Paris
Berne
Lyons
Rochefort
Biarritz
Perpignan
Marignane
Ajaccio
Mahon
Madrid
Coruña
Lisbon
Horta

CYCLONE.

New Zealand Waters.

The following is an extract from the Meteorological Record of S.S. *Doric Star*, Captain N. G. Oswald, Napier to Auckland. Observer, Mr. A. H. Pierce, 3rd Officer.

"During a passage from Napier to Auckland an intense cyclone was experienced. This storm caused widespread damage ashore and was reported to be one of the worst storms within living memory. The lowest barometer reading recorded in New Zealand was at Doubtless Bay, on the east coast, where a barometer 20 ft. above sea level registered 27.91 in. This is reported to be the lowest barometer reading ever recorded in New Zealand.

This vessel left Napier at 6.30 p.m. New Zealand Summer Time, on Saturday, 1st February, 1936, the weather then being heavily overcast with continuous rain, wind E.S.E. force 3, temperature 64° F. and the corrected barometer reading 29.75 in. The barometer had fallen slowly since 8 a.m.

Portland Island was rounded at 11 p.m. and at midnight the wind was E.N.E. force 5, temperature 64° F., barometer 29.60 in., sky completely overcast with continuous heavy rain. At 2 a.m. the barometer had fallen a further .14 in. with wind steadily increasing. At 4 a.m. speed was reduced owing to continuous torrential rain, the wind was then E.N.E. force 7 to 8, sea rough, temperature 63° F. and the barometer 29.30 in. By 7 a.m. the rain had ceased but the barometer was still falling rapidly and at 8 a.m. the wind was N.N.E. force 8, temperature 65° and the barometer 29.08 in. with a short steep sea and heavy swell. At 9 a.m. the vessel was hove to owing to the increasing sea, and conditions remained similar until noon, when the wind was N. by E. force 8, temperature 69° F., barometer 28.94 in., the sky being clear, but visibility only poor to moderate.

At 2 p.m. the wind, still remaining steady at N. by E., had increased to force 10 and the barometer had fallen to 28.79 in. At 2.30 p.m. the wind had reached hurricane force and the lowest barometer reading recorded was at 3 p.m. when it stood at 28.77 in. At this time it was noticed that heavy clouds were banking up and approaching from leeward, whilst at the same time the wind rapidly decreased in force, at 4 p.m. it was N. force 8, and the barometer had risen .02 in. Normal course and speed was now resumed. By 5 p.m. the sky was completely overcast with occasional drizzling rain and the wind was light variable airs. At 5.30 p.m. the wind came away from the S.S.W. and gradually increased in force until at 8 p.m., the ship then being off East Cape, the wind was blowing in gusts S.S.W. force 4 to 8, and the barometer had risen extremely rapidly to 29.24 in. From this time onwards the weather rapidly improved and the wind settled in S.W. force 5, the barometer continued rising rapidly and the sky cleared. By noon on the following day the barometer had risen to 30.00 in.

During the whole of this storm there was a short high sea running, but it was not considered exceptionally heavy in view of the strength of the wind. It was observed, however, that an exceptionally heavy sea was running on Ranfurly Bank off East Cape."

CYCLONE.

North Pacific Ocean.

The following account of a cyclone has been received from M.V. *Chinese Prince*, Captain W. Finch, Los Angeles to Kobe. Observer, Mr. L. G. Taylor, 3rd Officer.

Date.	Time.	Wind.		Barometer.	Remarks.
		Dir.	Force.		
1936. 4 February	8 p.m.	N.W.	4	mb. 1017.5	11.30 p.m. A.T.S. in approx. Latitude 30° 19′ N., Longitude 151° 20′ E. Wind suddenly backed to W. by S. force 4, with an accompanying long glassy swell from W. by S. Clouds Cu. 3/10–4/10.
1936. 4 February	Midt.	W.by S.	4	1013.4	Midt. a navigational warning was received from Japanese radio stations appertaining to a depression centred in about Latitude 35° 00′ N., Longitude 141° 00′ E. Barometer 29.13 in. and bearing E.N.E.; also notification of a W'ly gale off the S.E. coast of Japan. Ships to the north were reporting falling barometers and increasing S.W'ly winds.
5 February	1 a.m.	S.S.W.	6–7	1004.7	Fierce wind squalls and rain showers.
	4 a.m.				
	5 a.m.			997.6	All early a.m. hours there were squalls of hurricane force at times reaching force 10. Clouds mostly remaining Cu. moving fast from W. Wind and sea increased rapidly. Vessel reduced in speed at 6 a.m. to prevent any damage through heavy seas.
	6 a.m.			995.7	
	7 a.m.			997.9	
	8 a.m.			996.0	

"At 8.00 a.m. A.T.S. on 5th February, in approximately Latitude 30° 42′ N., Longitude 149° 49′ E., a sudden fierce wind squall came out from the west, piling the sea up in front of it, and the vessel had to be reduced to dead slow speed to safely 'ride' these oncoming waves, which were estimated to have a height of 50 to 60 ft.

From 8 a.m. onwards the wind was at hurricane force (W'ly in direction) almost all the time, and at a force of 12 at each succeeding wind squall. There had been a heavy swell running since late p.m. of yesterday and the result of this heavy swell, together with the fierce wind squalls which suddenly broke without any warning, made the sea high and dangerous.

At noon a Navigation Warning was received from Tokio that a 'Severe cyclone, 730 mm. (28.74 in.) was centred between Latitude 34° and 37° N. and Longitude 148°–151° E., moving E.N.E. rapidly.' The vessel's position then was Latitude 30° 51′ N., Longitude 149° 49′ E. approximately, barometer 997.0 mb. (29.45 in.), wind W. by S. force 11, and she was pitching and labouring heavily to intense cyclonic characteristics, and shipping water over all. It was impossible to make any weigh, and the only thing to do was to prevent the vessel falling off into the trough, at the same time 'nursing her' so that the least amount possible of heavy water came aboard. This was achieved very successfully by 'heaving to' with the wind and sea about a point on the port bow, and keeping the starboard engine at slow ahead to keep her up to the wind and sea. She lay very nicely, taking very little heavy water on board and, in as far as circumstances permitted, was as comfortable as could be expected. Occasionally there were brief lulls, only to be followed by intense squalls and high seas, very little rain and cloud other than the prevailing cumulus.

At 1.00 p.m. the barometer showed an appreciable tendency to rise and from 996.1 mb. at 12.30 p.m. it rose slowly to 998.7 mb. at 4.00 p.m. the wind becoming more W'ly all the time, though still of hurricane force, and the afternoon was marked by many fierce wind squalls.

As the wind veered round to W. by N. it was decided to change on to the starboard tack, and at 3.30 p.m. during a lull, the vessel was brought round to about W.S.W. dead slow on both engines. She was kept at this speed and, although she laboured heavily and rolled possibly more than she did on the other tack, no heavy water was shipped, almost all of it was heavy spray.

At 8.00 p.m. the barometer was 1004.1 mb., rising at the rate of .8 mb. an hour, and at midnight it was 1007.6 mb., Cu.-Nb. cloud predominated, moving fast from N.W. During the whole of the p.m. hours the seas were still precipitous and the swell long and heavy, with the wind abating very little. In fact the squalls from the N.W. were fiercer at times than they were in the early a.m. hours when the wind was S.W.

At 11.00 p.m. the wind shifted to N.W. and blew with fury, at times reaching force 12, and without the least warning dying out to a comparative lull, only to be followed, just as unexpectedly, by increasing wind and high seas.

At 2.00 a.m., Thursday, 6th February, the barometer was up to 1010.9 mb. with the sea and swell moderating considerably. Ci. cloud (4) showed to the westward with the Cu. breaking up and giving way to St.-Cu. The wind was still N.W'ly, but down to force 7/8, and the swell slowly was becoming less.

Weather conditions improved slowly all through the day to a slowly rising barometer, and late p.m. the wind had veered to N. force 4, with the swell becoming more N'ly.

The most noticeable characteristic of the cyclone was the absence of rain; what rain squalls were experienced were short in duration, possibly lasting not more than 30 seconds. Another striking effect was the unexpected and sudden burst of wind squalls which reached hurricane force, piling the sea up in front of them. It was at these times that the heights of the waves reached their maxima, and, more especially, when the squalls came from the N.W. as is to be expected.

It is estimated that the average height of the waves during the most severe part of the cyclone, as experienced by this vessel, was from 40 to 50 ft. with a length of about 500 to 600 ft., with the exception of the abnormally high waves which necessitated the immediate slowing down of the vessel at 8.00 a.m. on the morning of Wednesday, 5th February, when they were easily from 50 to 60 ft. in height.

The vessel was in radio communication with the American steamer *President Garfield* all the time and, though her position was approximately some 250 miles to the north and west of us, she was experiencing much the same winds with much the same forces and, in general, very much the same weather conditions."

AURORA.

Southern Ocean.

The following extracts are from the Meteorological Log of R.R.S. *Discovery II*, Captain L. C. Hill, O.B.E., Melbourne to Fremantle via Ice Edge. Observer, Mr. T. Oates, 3rd Officer.

"18th March, 1936. Commencing at 1105 G.M.T. and continuing until approximately 1305 G.M.T., a very clear Aurora Australis was observed across the N.E. quadrant. At 1111 G.M.T. the time of maximum brilliance, two distinct curtains of light hung from the zenith to within 18° of N.E. horizon. At 1125 G.M.T. the phenomenon commenced to wane, leaving the appearance of nebulous masses of pale green light. A period of brilliance recurred at 1135 G.M.T. and continued until 1250 G.M.T. when it finally disappeared. Clouds Cu. and St.-Cu. 2/10. Position of ship, Latitude 61° 30′ S., Longitude 133° 32′ E.

26th March, 1936. At 2054 G.M.T. a faint auroral display was observed as a straw-coloured curtain of light extending from the zenith to the N.E. horizon. Very little movement was observed and the display faded at 2105 G.M.T. Clouds Cu., St.-Cu. and A.-Cu. 5/10. Position of ship, Latitude 63° 32′ S., Longitude 100° 39′ E.

28th March, 1936. At 2154 G.M.T. until 2400 G.M.T. an auroral display was observed to the N.E. An occasional curtain formation was seen, but the display for the most part consisted of large masses of light. Clouds Cu. 5/10.

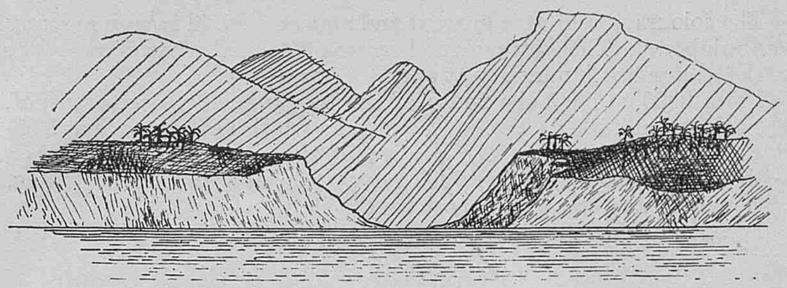
Position of ship, Latitude 60° 00′ S., Longitude 102° 50′ E."

MIRAGE.

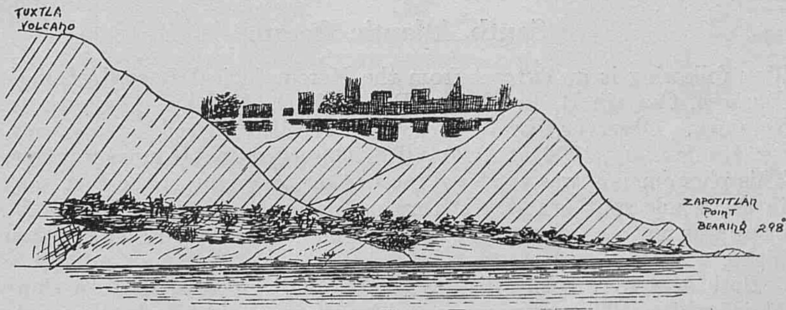
Gulf of Mexico.

The following is an extract from the Meteorological Record of S.S. *San Adolfo*, Captain H. Paterson, Puerto Mexico to Tampico. Observer, Mr. L. W. Wilson, 2nd Officer.

"14th February, 1936, from 1.05 p.m. Latitude 18° 32′ N., Longitude 94° 40′ W. until 2.10 p.m. Latitude 18° 43′ N., Longitude 94° 50′ W. Barometer 29.92 in., air 87° F., sea 76° F., visibility 9. Sky cloudless. Observed two mirages, No. 1 bearing 018° and No. 2 bearing 294°. Ship's course 325°. The appearance of a fog bank lay on the horizon, the angular height of which was 2° 10′. The mirage to seaward, No. 1, was directly opposite the sun, and slowly opened its bearing on the starboard bow, as the sun altered its bearing. This mirage was visible for 1 hour 5 minutes, it maintained the same appearance throughout, and always bore directly opposite the sun. It appeared as two headlands forming an entrance to a bay or harbour, and trees were clearly visible, also hills in the background. The fronts of these headlands were a sandy colour. When this mirage commenced to disappear it rose up from the horizon, and became fainter, until when it reached the top of the fog bank it disappeared instantly. The fog bank cleared away 9 minutes later.



No 1



No 2

The other mirage, No. 2, was over the land and appeared between two mountains, it was visible from 1.05 p.m. until 1.24 p.m., and appeared as a harbour, surrounded by large buildings, some of these buildings were inverted and appeared to resemble reflections of the other buildings. As this mirage disappeared, it changed its appearance, becoming narrower, until it was only two black lines in the sky, separated by a white line. The white line was visible all the time, and separated the inverted buildings from the upright buildings."

LUNAR RAINBOW.

North Atlantic Ocean.

The following is an extract from the Meteorological Record of S.S. *City of Roubaix*, Captain W. Gray, Dakar to Liverpool. Observer, Mr. K. G. Gregory, 2nd Officer.

"5th March, 1936, 0315, observed signs of lunar rainbow forming, moon bearing 280° altitude 10° 45′. At this period there was a trace of Ci.-St. cloud in eastern sky, with Cu.–Nb. clouds increasing and partially obscuring the sky to the north, moving slowly south-east. From 0315 to 0325, the bow gradually developed into a perfect arc of whitish colour. Altitude of apex 40°, bearing of base 045° and 135° approximately. The greatest luminosity appeared at the base, which was wider than the apex. At 0325 colours gradually became discernible, until at 0330 the bow consisted of red $\frac{2}{10}$, orange $\frac{1}{10}$, yellow $\frac{1}{10}$, green $\frac{3}{10}$, blue $\frac{1}{10}$, silver $\frac{2}{10}$.

The colours were quite apparent and almost as vivid as seen in many sun rainbows. The width of the bow was 4°, the altitude of apex 36°, with the greatest luminosity at apex.

From 0330 to 0345 the width of the bow gradually decreased and the colour diminished; the bow assumed a whitish colour until at 0345 it disappeared. The eastern portion of the sky was then obscured with Cu.-Nb. clouds, from which heavy rain appeared to be falling, although no rain was experienced on the ship.

Position of ship, Latitude 40° 35′ N., Longitude 11° 00′ W."

LUNAR RAINBOW.

South Atlantic Ocean.

The following is an extract from the Meteorological Record of M.V. *Durham*, Captain H. L. Upton, D.S.C., R.D., R.N.R., Fremantle to Dunkirk. Observer, Mr. W. J. V. Branch, 3rd Officer.

"4th January, 1936, at 22.30 A.T.S. Observed double lunar rainbow. This phenomenon was rendered interesting by virtue of the fact that in the whole southern sky, the moon bearing approximately N.N.E., there was no trace of any rain, mist or cloud. It was a brilliantly clear night.

Both arcs were easily distinguishable and appeared to be a shiny bluish-white. They were separated by about 8° of altitude, the upper one being 28°.

Stars were plainly visible on either side of the arcs but not through them. Air 69° F., sea 69° F., relative humidity 84 per cent.

Position of ship, latitude 18° 00′ S., Longitude 4° 30′ W."

LINE SQUALL AND WATERSPOUT.

Tasman Sea.

The following is an extract from the Meteorological Record of S.S. *Buteshire*, Captain C. A. I. Laird, Sydney to Brisbane. Observer, Mr. P. MacMillan, Chief Officer.

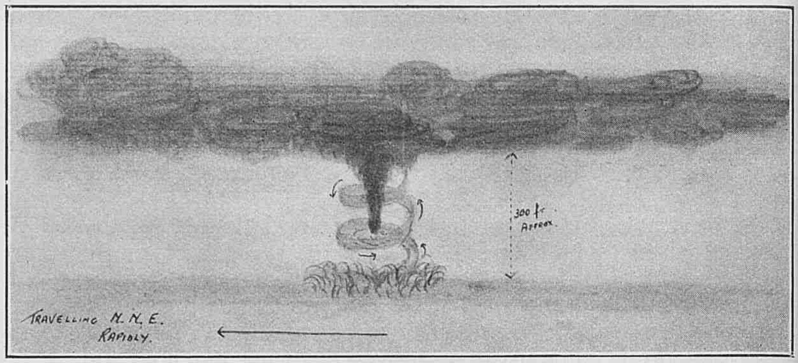
"16th January, 1936, 4.10 p.m. (0610 G.M.T.). Wind backed suddenly from N.N.E., force 4, to W., force 3. 4.15 p.m. Line squall cloud passed over ship. Wind backed suddenly to S.S.W., freshening to force 6. 4.20 p.m. Wind freshened to force 8, with gusts of hurricane force, accompanied by violent thunderstorm. Line squall cloud very definite overhead and to seaward, but very ragged over the land. 4.24 p.m. The lower end of a waterspout, just forming, passed about 20 ft. ahead of ship, travelling E.N.E. The spray from the sea rose to a height of 60 ft. (approximate), was violently agitated, and the whole phenomenon was accompanied by a high shrieking noise, apparently due to the violent movement of the air around the spout. No cloud pendant was seen. Almost immediately after the passage of this spout torrential rain commenced. At 4.40 p.m. wind backed to S., moderating to force 5. Moderate rain till 4.50 p.m. At 6.00 p.m. wind veered gradually, through W., to N.E., moderating to force 2.

At 4.15 p.m. barometer rose suddenly from 996.9 mb. to 1003.1 mb. Thermometer fell from 77° F. to 72° F. Position of ship, 32° 36′ S., 152° 29′ E."

WATERSPOUT.

China Sea.

The following account of a waterspout has been received from M.V. *Chinese Prince*, Captain W. Finch, Yokohama to Manila. Observer, Mr. L. G. Taylor, 3rd Officer.


300 ft Approx.
Travelling N.N.E. Rapidly.

"Saturday, 22nd February, 1936, at 6.00 p.m. A.T.S. Wind, south-east, force 5. Temperature, air 72° F., sea 72° F. Barometer 29.56 in. St.-Cu. and Nb. cloud.

Five minutes previous to encountering this phenomenon a heavy rain squall of tropical intensity passed over with raindrops about the size of a sixpence and lasting for about three minutes.

Cloud formation was that of line squall, heavy and black. The core of the waterspout did not extend right down to the water's edge, and was encircled by a spiral of heavy spray whirling around it in an anti-clockwise direction. The average diameter of this spiral was estimated to be about 200 ft. A very noticeable feature, and an unusual one too, was the fact that the water's edge at the base of the spiral was one mass of small jets of spray, having the appearance of small fountains.

The height from the water's edge to the cloud was estimated to be about 300 ft. The Wireless Operator reported that, previous to the waterspout, atmospherics were very bad, but immediately after the vessel passed the phenomenon, they disappeared altogether and radio reception was almost perfect. The vessel passed within about ½ mile of the phenomenon.

Position of ship, Latitude 24° 42′ N., Longitude 127° 08′ E."

LUNAR ECLIPSE.

South China Sea.

The following is an extract from the Meteorological Record of M.V. *Tantalus*, Captain D. E. Evans, Hong Kong to Singapore. Observer, Mr. G. Drake, 2nd Officer.

9th January, 1936, at 1.31 a.m. ship's time (1827 G.M.T., 8th January). Very heavy rain lasting from 11.30 p.m. to 1.15 a.m., clearing away from the southeastward, showed the moon to be just emerging from total eclipse. A very thin segment on the south-east side (relative to ship's compass) was clear of shadow, but the whole moon was clearly perceptible, appearing dark brown or reddish-brown. The depth of the shadow seemed to be subject to constant change of intensity in a flickering sort of way.

As the shadowed part slowly decreased, so a lunar halo of 22½° radius grew around the emergent segment.

Whilst the illuminated part was still small, the edge of the shadow was sharply defined, but it became rather more diffuse as the shaded part decreased, retaining, however, considerable definition to the end.

Observation through a small telescope of 12x power showed, within the edge of the shadow, occasional sharp pin-points of light, which gleamed momentarily and vanished.

The whole phenomenon ended at 2.56 a.m. ship's time when the halo, which had slowly decreased in intensity as it increased in arc, vanished altogether.

Position of ship, Latitude 6° 38′ N., Longitude 107° 50′ E."

METEOR.

North Pacific Ocean.

The following is an extract from the Meteorological Log of M.V. *Alynbank*, Captain D. Gillies, San Pedro to Kobe. Observer, Mr. A. C. Glover, 3rd Officer.

"On 31st January, 1936, at 1229.30 G.M.T. and 22.24.30 A.T.S., a brilliant yellowish-red meteor bearing N.W. was observed to be falling from an altitude approximately that of the constellation of Corvus and travelling obliquely in a southerly direction.

Its magnitude was three to four times that of Sirius, and it rapidly gained momentum in its flight. In passing behind a fine bank of cumulus, the meteor appeared to be magnified three or four times; while the trail presented a beautiful spectacle, the colours of the spectrum could be clearly defined, and it appeared as though there was a miniature rainbow there. Upon reappearing, however, the meteor assumed its normal size, but had gained greater velocity, also the colour had changed from a yellowish-red to a greenish-white. It finally disappeared from view behind a bank of stratus at an altitude of approximately 12°.

The meteor was visible for about 3–4 seconds.

Position of ship, Latitude 30° 04′ N., Longitude 152° 36½′ E."

METEOR.

South Pacific Ocean.

The following is an extract from the Meteorological Record of M.V. *Rangitata*, Captain E. Holland, Balboa to Wellington. Observer, Mr. H. P. Williamson, 3rd Officer.

"28th February, 1936, at 0326 G.M.T., time at ship being 8.43 p.m. 27th February, observed bright orange-coloured meteor. This meteor first appeared in a large gap between A.-Cu. clouds at a low altitude of approximately 5° bearing approximately 260°, and was visible for one second, rising rapidly, leaving a dull trail behind and giving a momentary impression of a rocket having been fired.

Four seconds later the meteor again appeared at an approximate altitude and bearing of 26° and 250°. At the time of its second appearance from behind the clouds, the trail at the first gap disappeared, and the trail remained at the second gap for a period of four seconds. The sky was mainly overcast at the time with A.-Cu. clouds, though the moon, which was five days old, showed occasionally through gaps in the clouds. The magnitude of this meteor was about that of Venus.

By calculation we get the following at the time of observation:

The moon	altitude	23°	bearing	298°
Rigel	,,	58°	,,	266°
Canopus	,,	43°	,,	202°

This is the only rising meteor that I have seen and a search through some 36 numbers of The Marine Observer revealed only one other instance of a meteor which increased its altitude during observed flight, that seen in the N. Atlantic, on board the *Duchess of Richmond*, 17th November, 1931.

Position of ship, Latitude 7° 05′ S., Longitude 98° 06′ W."

CAPTAIN HUGH FREDERICK DAVID, R.D., R.N.R.

By one of his Officers.

In the death of Captain Hugh F. David, the Merchant Navy loses a distinguished and a very striking personality.

Possibly I may claim to a more intimate knowledge of him than most of his contemporaries, for it was my privilege to have been acquainted with him for over forty years, and to sail with him as a senior officer for a total period of about five years in various White Star ships under his command, during which time I found much to inspire one in all those qualities which one expects to find in the typical British shipmaster, and which he possessed in such a large degree.

Apart from his professional qualities, he was also one of the largest hearted and most generous men I ever knew, though " the way of the transgressor " was apt to be a trifle hard with David, but he had a sense of humour which was undeniable and I recall an instance affecting the Meteorological Office when he suspected a junior officer (and rightly so !) of having " ditched " the Meteorological Log, etc., before the commencement of a voyage to New Zealand, probably with a view to lessening the J.O.'s burden, when he remarked in his breeziest manner, " never mind Mr. So-and-So, you can rule up a Manuscript Book day by day, I have no doubt Campbell Hepworth will be equally pleased," and the dismay of the same officer when at the end of the four months voyage he suggested that possibly the Meteorological Office would provide a fresh copy of the Fair Log into which he could copy his valuable observations in his spare time.

I first met David at drill on board H.M.S. *Eagle* performing my early drills in '95, he being then a 2nd Officer, I think, in the White Star Line, a position he had but recently accepted after his resignation as 1st Officer in the Inman Line, where he, and I believe only one other officer, had declined to assume American citizenship in order to keep their jobs as 1st Officer; and I well recall the impression of his deep and hearty voice, and the more than tolerant interest he took in we youngsters in the Gunroom, an interest I subsequently found to be boundless where youngsters were concerned, and, in the course of time extended to my own small family who invariably hailed his advent with delight.

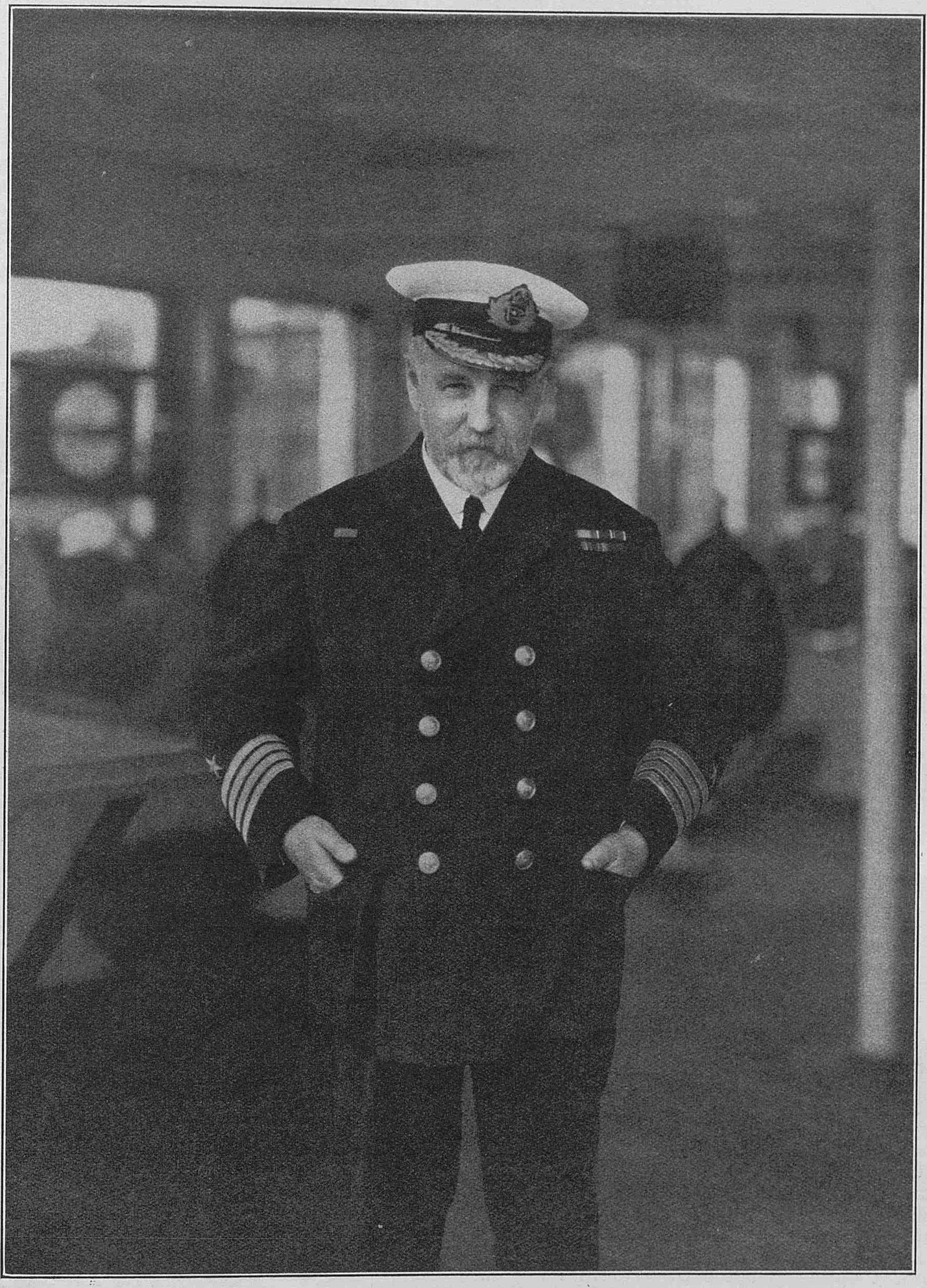
An unusually well-informed man on most subjects and a very strong character withal, his principles as a navigator were based on the soundest of all foundations—safety first and all the time—and he applied them religiously, right through his career in command, and no one who sailed with him in New Zealand waters can forget his application of them there, where, as he put it, most of the coast had " never been surveyed since Old Man Cook's time " and as a result of which I don't think he once suffered a casualty of any kind.

He was excellent as an after dinner speaker : his speeches invariably being really sound and considered orations, delivered with emphasis and a knowledge of his subject which was unimpeachable.

An ardent admirer of the fine arts, his cabin was seldom without something good in the way of paintings and etchings, upon which he would delight to expatiate and perhaps at the conclusion of a particularly clear run through the ice track on the Canadian Service, if he thought one really interested, he would frequently present his listener with the picture under discussion " just to mark the occasion," as he would say.

No doubt there have been others in the past and will be others in the future, whose good fortune it may have been or will be, to inherit such characteristics as those of Hugh Frederick David, but I would say unhesitatingly there cannot be too many of them in the British Merchant Navy and in the Honourable Company of Master Mariners, of which he was a foundation member and a member of the Court for some years.

S.S.R.



The Master of "Olympic" 1923

CAPTAIN H. F. DAVID, R.D., R.N.R.

THE EXTRACTION AND COMPILATION OF MARINE METEOROLOGICAL DATA BY MECHANICAL METHODS.

PREPARED IN THE MARINE DIVISION BY H. T. SMITH.

THE solution of the problem of finding a really efficient method of utilizing to their full extent the observations contributed by voluntary marine observers is one that has always presented great difficulty of accomplishment. Various methods of handling marine data were tried in the early years after the formation of the Meteorological Department in 1854. FitzRoy introduced a "collection book" in which the observations for a particular element were entered. Later, a system of copying each observation on a card was tried without success, and was superseded by Captain TOYNBEE's system of data books. Each data book contained the observations for one month in a Marsden ten degree square. The ten degree square was divided up into a hundred subsquares of 1° of Latitude by 1° of Longitude (*see* FIGURE 1) and the pages of the book numbered in accordance with the subsquare numbers.

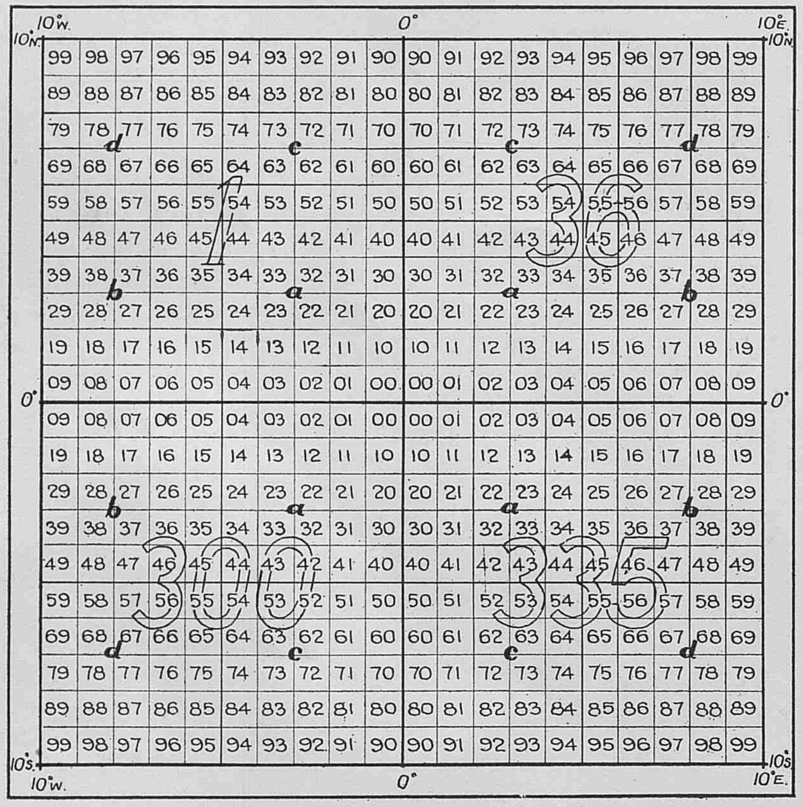


Figure 1.—Four Marsden 10° squares subdivided into 5° squares and 1° subsquares.

This proved the most efficient of any, and was continued with modifications in the form of the data book until the adoption of the Hollerith Electrical Tabulating and Sorting Machines in May, 1921. Captain BROOKE SMITH, the Marine Superintendent, had remarked, soon after taking over the Marine Division in November, 1919, on the laboriousness of the task of copying out observations into data books, and commented that the work was more suitable for a machine than a man. Later, Mr. C. S. DURST, Senior Professional Assistant in the Marine Division, found that the Hollerith machine, which was already in use in the Air Ministry for making a census of the health of the Air Force, could be used equally well to make a "census" of the weather over the oceans. A preliminary trial of this system was made in an investigation of the conditions in the Indian Ocean adjacent to Cape Guardafui, and this having proved successful, the Hollerith System was taken into general use for the extraction of marine meteorological data. Two items did not lend themselves to inclusion on the Hollerith card—currents and, for obvious reasons, remarks on interesting phenomena. The method of dealing with ocean currents is to compute the resultant current for small areas, and to group the currents for several of these small areas into a current rose, thus showing in the first instance the mean set of the current and in the second the vagaries which go to make it up. It was not convenient or economical to include the information necessary to do this on the cards, and therefore the data books were retained, and are used solely for the extraction of the currents.

Remarks on interesting phenomena are indexed, reference being given to the number of the log, date, Marsden square and subsquare, so that all information received about any phenomenon is easily accessible.

As a result of adopting this system, the rate of data extraction has increased. With the lessening of much of the drudgery which the data book system involved, more attention has been given to the examination and investigation of currents and to the remarks on interesting phenomena.

From time to time it has been possible to stimulate the work at sea by publishing results in THE MARINE OBSERVER.

Briefly the Hollerith System may be described as one in which given figures can be represented on a card by holes punched in corresponding positions on the card. The punched cards are inserted in delicate machinery in which electrical contact is made through the holes, enabling the cards to be sorted into groups or adding the columns of figures thus represented and counting the cards. It is worked by means of three machines, each representing a phase in the extraction and computation of marine meteorological data.

(1) The Key Punch by means of which the observations are punched on to cards.

(2) The Sorting Machine whereby the punched cards are sorted into appropriate groupings.

(3) The Tabulating Machine whereby the punched cards are totalled and counted.

Extraction of Marine Meteorological Data.

Since this system deals with figures only, it is obvious that meteorological observations cannot be dealt with just as they are received entered in the log. It is necessary that such elements as wind, sea and swell, clouds and their direction, also weather, should be represented by figures, and for this purpose the following code has been devised and is used for preparing the observations in logs for extraction on to the cards.

Code for Extraction of Marine Data by Hollerith Machine.

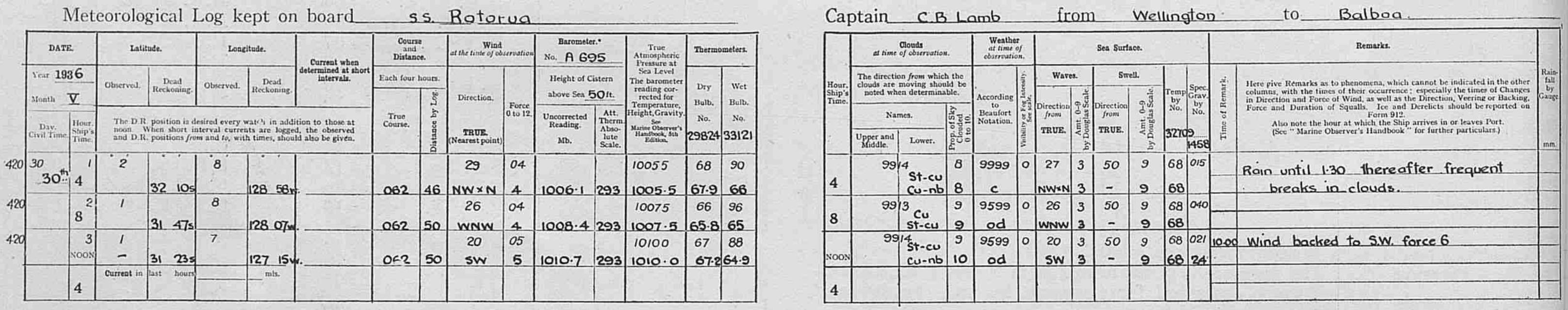
Column of Card.	Element.	Code.
		The number of the log in which the observation is recorded is stamped on the back of the card.
1 & 2 ...	Year ...	Last two figures. Thus 1923 = 23.
3 ...	Month ...	January = 1 July = 7 February = 2 August = 8 March = 3 September = 9 April = 4 October = 10 May = 5 November = 11 June = 6 December = 12
4, 5 & 6	Marsden square number.	The globe is divided into 10° squares according to the Marsden chart and the position of the observation is given by the Marsden square number from that chart. Thus: an observation taken between the limits of Latitude 20° 00′ N. and Latitude 29° 59′ N. and Longitude 30° 00′ W. and Longitude 39° 59′ W. is given the Marsden square number 076.
7 & 8 ...	Day of month	Thus: 25 = 25th day of the month.
9 ...	Watch ...	The hour at which the observation was made is coded thus: 4 a.m. = 1 4 p.m. = 4 8 a.m. = 2 8 p.m. = 5 Noon = 3 Midnight = 6
10 & 11	Marsden subsquare number.	Each Marsden square is sub-divided into 100 parts. The number of the "subsquare" is obtained by taking the last figure of the whole number of degrees of the Latitude and the last figure of the whole number of degrees of Longitude. Thus: An observation made in Latitude 27° 55′ N., Longitude 31° 28′ W., would be given the Marsden square number 076 and the Marsden "subsquare" number 71.

<table>
<tr><th>Column of Card.</th><th>Element.</th><th>Code.</th></tr>
<tr><td>12 & 13</td><td>Wind direction</td><td>Calm or light and variable airs = 99
N. by E. = 01 S. by W. = 17
N.N.E. = 02 S.S.W. = 18
N.E. by N. = 03 S.W. by S. = 19
N.E. = 04 S.W. = 20
N.E. by E. = 05 S.W. by W. = 21
E.N.E. = 06 W.S.W. = 22
E. by N. = 07 W. by S. = 23
E. = 08 W. = 24
E. by S. = 09 W. by N. = 25
E.S.E. = 10 W.N.W. = 26
S.E. by E. = 11 N.W. by W. = 27
S.E. = 12 N.W. = 28
S.E. by S. = 13 N.W. by N. = 29
S.S.E. = 14 N.N.W. = 30
S. by E. = 15 N. by W. = 31
S. = 16 N. = 32
No observation = 00</td></tr>
<tr><td>14 & 15</td><td>Wind force</td><td>By Beaufort Scale (<i>vide</i> Marine Observers Handbook M.O. 218)
<table>
<tr><td rowspan="2">Calm</td><td>= 00</td></tr>
<tr><td>= 01</td></tr>
<tr><td rowspan="2">Light winds</td><td>= 02</td></tr>
<tr><td>= 03</td></tr>
<tr><td rowspan="4">Moderate</td><td>= 04</td></tr>
<tr><td>= 05</td></tr>
<tr><td>= 06</td></tr>
<tr><td>= 07</td></tr>
<tr><td rowspan="5">Gales</td><td>= 08</td></tr>
<tr><td>= 09</td></tr>
<tr><td>= 10</td></tr>
<tr><td>= 11</td></tr>
<tr><td>= 12</td></tr>
</table>
No observation = 00</td></tr>
<tr><td>16 to 20</td><td>Pressure ...</td><td>The pressure is given in millibars to one place of decimals, corrected for temperature and gravity and reduced to M.S.L.
Thus 1017.6 mb. = 10176
No observation = 00000</td></tr>
<tr><td>21 & 22</td><td>Dry bulb temperature</td><td>In degrees Faht. to nearest whole degree.
No observation = 00</td></tr>
<tr><td>23 & 24</td><td>Humidity ...</td><td>Percentage of relative humidity 01 to 99, except 9 and 10 per cent., coded 09; 100 per cent. coded 10.
No observation = 00</td></tr>
<tr><td>25 ...</td><td>Upper cloud type.</td><td>Cirrus = 1 Ci. and Ci-St. = 4
Ci-St. = 2 Ci. and Ci-Cu. = 5
Ci-Cu. = 3 Ci-St. and Ci-Cu. = 6
No observation = 0
No upper cloud = 9</td></tr>
<tr><td>26 ...</td><td>Middle cloud type.</td><td>A-Cu. = 1, A-St. = 2, A-Cu and A-St. = 3, no observation = 0, no middle cloud = 9.</td></tr>
<tr><td>27 & 28</td><td>Lower cloud type.</td><td>St-Cu. = 1 Cu-Nb. = 4
Nb. = 2 St. = 5
Cu. = 3 Scud = 6
Overcast = 88 No lower cloud = 99
No observation = 00
Example : Ci-St./Cu. = 2939
A-St. = 9299
Ci. Ci-Cu./St-Cu. = 5919</td></tr>
<tr><td>29 ...</td><td>Proportion of sky clouded.</td><td>
<table>
<tr><td>Cloud amount 0</td><td rowspan="2">= 1</td></tr>
<tr><td>,, ,, 1</td></tr>
<tr><td>,, ,, 2</td><td>= 2</td></tr>
<tr><td>,, ,, 3</td><td>= 3</td></tr>
<tr><td>,, ,, 4</td><td>= 4</td></tr>
<tr><td>,, ,, 5</td><td>= 5</td></tr>
<tr><td>,, ,, 6</td><td>= 6</td></tr>
<tr><td>,, ,, 7</td><td>= 7</td></tr>
<tr><td>,, ,, 8</td><td>= 8</td></tr>
<tr><td>,, ,, 9</td><td rowspan="2">= 9</td></tr>
<tr><td>,, ,, 10</td></tr>
<tr><td>No observation</td><td>= 0</td></tr>
</table></td></tr>
<tr><td>30 ...</td><td>Weather (visibility).</td><td>By Beaufort Notation (<i>vide</i> Marine Observers Handbook M.O. 218)
Ordinary Visibility = 9
V (Exceptional Visibility) = 1
Z (Haze) = 2
M (Mist) = 3
F (Fog) = 4
No observation = 0</td></tr>
<tr><td>31–33 ...</td><td>Weather ...</td><td>By Beaufort Notation (<i>vide</i> Marine Observers Handbook M.O. 218)
S (Snow) = 1 T (Thunder) = 6
Q (Squalls) = 2 H (Hail) = 7
R (Rain) = 3 L (Lightning) = 8
P (Passing showers) = 4 None of the above reported = 9
D (Drizzle) = 5
No observations = 000
Example : Snow, Squalls = 129
Rain = 399
Thunder, Hail, Lightning = 6</td></tr>
<tr><td>34 ...</td><td>Visibility ...</td><td>Fog and Visibility Scale.
(Specification for use at Sea.)
<table>
<tr><td>Dense fog ... ...</td><td>Objects not visible at 50 yards ... ...</td><td>0</td><td rowspan="2">= 1</td></tr>
<tr><td>Thick fog ... ...</td><td>Objects visible 1 cable</td><td>1</td></tr>
<tr><td>Fog ... ...</td><td>,, ,, 2 cables</td><td>2</td><td>= 2</td></tr>
<tr><td>Moderate for ...</td><td>,, ,, ½ mile</td><td>3</td><td>= 3</td></tr>
<tr><td>Mist or haze, or very poor visibility</td><td>,, ,, 1 mile</td><td>4</td><td>= 4</td></tr>
<tr><td>Poor visibility ...</td><td>,, ,, 2 miles</td><td>5</td><td>= 5</td></tr>
<tr><td>Moderate visibility</td><td>,, ,, 5 miles</td><td>6</td><td>= 6</td></tr>
<tr><td>Good visibility ...</td><td>,, ,, 10 miles</td><td>7</td><td>= 7</td></tr>
<tr><td>Very good visibility</td><td>,, ,, 30 miles</td><td>8</td><td>= 8</td></tr>
<tr><td>Excellent visibility</td><td>,, ,, more than 30 miles</td><td>9</td><td>= 9</td></tr>
<tr><td>No observations</td><td>... ... ...</td><td></td><td>= 0</td></tr>
</table></td></tr>
<tr><td>35–36 ...</td><td>Sea direction</td><td>No disturbance = 99 Confused sea = 50
N. by E. = 01 from N. by E. = 51
N.N.E. = 02 N.N.E. = 52
N.E. by N. = 03 N.E. by N. = 53
N.E. = 04 N.E. = 54
N.E. by E. = 05 N.E. by E. = 55
E.N.E. = 06 E.N.E. = 56
E. by N. = 07 E. by N. = 57
E. = 08 E. = 58
E. by S. = 09 E. by S. = 59
E.S.E. = 10 E.S.E. = 60
S.E. by E. = 11 S.E. by E. = 61
S.E. = 12 S.E. = 62
S.E. by S. = 13 S.E. by S. = 63
S.S.E. = 14 S.S.E. = 64
S. by E. = 15 S. by E. = 65
S. = 16 S. = 66
S. by W. = 17 S. by W. = 67
S.S.W. = 18 S.S.W. = 68
S.W. by S. = 19 S.W. by S. = 69
S.W. = 20 S.W. = 70
S.W. by W. = 21 S.W. by W. = 71
W.S.W. = 22 W.S.W. = 72
W. by S. = 23 W. by S. = 73
W. = 24 W. = 74
W. by N. = 25 W. by N. = 75
W.N.W. = 26 W.N.W. = 76
N.W. by W. = 27 N.W. by W. = 77
N.W. = 28 N.W. = 78
N.W. by N. = 29 N.W. by N. = 79
N.N.W. = 30 N.N.W. = 80
N. by W. = 31 N. by W. = 81
N. = 32 N. = 82
No observation = 00</td></tr>
<tr><td>37 ...</td><td>Sea amount Douglas Scale.</td><td>Sea Scale.
<table>
<tr><th>Scale No.</th><th>Description.</th><th>Code.</th></tr>
<tr><td>0</td><td>Calm ... ...</td><td>0</td></tr>
<tr><td>1</td><td>Smooth ... ...</td><td>1</td></tr>
<tr><td>2</td><td>Slight ... ...</td><td>2</td></tr>
<tr><td>3</td><td>Moderate ... ...</td><td>3</td></tr>
<tr><td>4</td><td>Rough ... ...</td><td>4</td></tr>
<tr><td>5</td><td>Very rough ... ...</td><td>5</td></tr>
<tr><td>6</td><td>High ... ...</td><td>6</td></tr>
<tr><td>7</td><td>Very high ... ...</td><td>7</td></tr>
<tr><td>8</td><td>Precipitous ... ...</td><td>8</td></tr>
<tr><td>9</td><td>Confused ... ...</td><td>9</td></tr>
</table>
No observation = 0</td></tr>
<tr><td>38 & 39</td><td>Swell direction.</td><td>Same as for Sea direction.</td></tr>
<tr><td>40 ...</td><td>Swell amount Douglas Scale.</td><td>Swell Scale.
<table>
<tr><th>Scale No.</th><th>Description.</th><th>Code.</th></tr>
<tr><td>0</td><td>No swell ... ...</td><td>0</td></tr>
<tr><td>1</td><td>Low swell, short or average length ... ...</td><td>1</td></tr>
<tr><td>2</td><td>Low swell, long ... ...</td><td>2</td></tr>
<tr><td>3</td><td>Moderate swell, short ... ...</td><td>3</td></tr>
<tr><td>4</td><td>Moderate swell, average length</td><td>4</td></tr>
<tr><td>5</td><td>Moderate swell, long ... ...</td><td>5</td></tr>
<tr><td>6</td><td>Heavy swell, short ... ...</td><td>6</td></tr>
<tr><td>7</td><td>Heavy swell, average length ...</td><td>7</td></tr>
<tr><td>8</td><td>Heavy swell, long ... ...</td><td>8</td></tr>
<tr><td>9</td><td>Confused... ... ...</td><td>9</td></tr>
</table>
No observation = 0</td></tr>
</table>

Column of Card.	Element.	Code.
41 & 42	Sea temperature.	In degrees Fahr. to nearest whole degree. No observation = 00.
43 ...	Upper cloud motion.	Stationary upper cloud = 9 Upper cloud from N.E. = 1 „ „ E. = 2 „ „ S.E. = 3 „ „ S. = 4 „ „ S.W. = 5 „ „ W. = 6 „ „ N.W. = 7 „ „ N. = 8 No observation = 0
44 ...	1/6 degree of Latitude.	Minutes of Latitude divided by 10, neglecting remainder. 0– 9 = 0 30–39 = 3 10–19 = 1 40–49 = 4 20–29 = 2 50–59 = 5 No minutes of Latitude given = 9
45 ...	1/6 degree of Longitude.	Same as minutes of Latitude.

The code given above was put into use on the 1st January, 1930. It was found necessary to amend the first code used in 1921 owing to ambiguities which arose when the cards were listed on the Printer Tabulator for purposes of supplying data to other meteorological services. The present code is proving entirely satisfactory. It must be noted that any change in the code used or any change in the order of the columns on the card involves the commencing of a new series of cards and the two or more series have to be stowed separately and generally used separately in the computing machines. It is therefore essential that no change should be made in the system.

When the Hollerith System was first introduced in 1921, the logs were fully coded in the Marine Division and passed to the Statistical Branch of the Air Ministry where an operator punched the coded figures. In 1931 the Honourable Company of Master Mariners petitioned the President of the Board of Trade requesting that the observations contributed by seamen to the Meteorological Office since its inception in 1854 might be fully utilized, and from them uniform meteorological charts of all oceans constructed for the use of seamen. A million sets of observations received in the Marine Division between 1855 and 1920 in the North Atlantic and Pacific Oceans had never been converted into a usable form. A scheme was drawn up whereby the essential elements, wind, air and sea temperature, humidity, cloud amount and weather could be punched on to an abbreviated card (shown in FIGURE 5) in the Marine Division, the work of coding and punching the observations being performed in one operation.



Meteorological Log kept on board s.s. Rotorua Captain C.B Lamb from Wellington to Balboa.

Year 1936 Month V. Barometer.* No. A 695. Height of Cistern above Sea 50ft. Thermometers: Dry Bulb No. 29824, Wet Bulb No. 33121.

The D.R. position is desired every watch in addition to those at noon. When short interval currents are logged, the observed and D.R. positions *from* and *to*, with times, should also be given.

	DATE. Day. Civil Time.	Hour. Ship's Time.	Latitude. Observed.	Latitude. Dead Reckoning.	Longitude. Observed.	Longitude. Dead Reckoning.	Current when determined at short intervals.	Course and Distance (each four hours). True Course.	Distance by Log.	Wind at the time of observation. Direction. TRUE. (Nearest point)	Force 0 to 12.	Barometer. Uncorrected Reading. Mb.	Att. Therm. Absolute Scale.	True Atmospheric Pressure at Sea Level. The barometer reading corrected for Temperature, Height, Gravity. See Marine Observer's Handbook, 5th Edition.	Dry Bulb.	Wet Bulb.
420	30 30th	1 4	2	32 10s	8	128 58w.		062	46	29 NW×N	04 4	1006·1	293	10055 1005·5	68 67·9	90 66
420		2 8	1	31 47s	8	128 07w.		062	50	26 WNW	04 4	1008·4	293	10075 1007·5	66 65·8	96 65
420		3 NOON	1 –	31 23s	7	127 15w.		062	50	20 SW	05 5	1010·7	293	10100 1010·0	67 67·2	88 64·9
		4	Current in last hours		mls.											

The direction *from* which the clouds are moving should be noted when determinable.

Here give Remarks as to phenomena, which cannot be indicated in the other columns, with the times of their occurrence; especially the times of Changes in Direction and Force of Wind, as well as the Direction, Veering or Backing, Force and Duration of Squalls. Ice and Derelicts should be reported on Form 912. Also note the hour at which the Ship arrives in or leaves Port. (See "Marine Observer's Handbook" for further particulars.)

Hour. Ship's Time.	Clouds at time of observation. Names. Upper and Middle.	Lower.	Prop. of Sky Clouded 0 to 10.	Weather at time of observation. According to Beaufort Notation.	Visibility or Fog Intensity. See scale.	Sea Surface. Waves. Direction from TRUE.	Amt. 0–9 by Douglas Scale.	Swell. Direction from TRUE.	Amt. 0–9 by Douglas Scale.	Temp by No. 32709	Spec. Grav. by No. 1458	Time of Remark.	Remarks.	Rainfall by Gauge. mm.
4	99	4 St-cu Cu-nb	8 8	9999 c	0	27 NW×N	3 3	50 –	9 9	68 68	015		Rain until 1·30 thereafter frequent breaks in clouds.	
8	99	3 Cu St-cu	9 9	9599 od	0	26 WNW	3 3	50 –	9 9	68 68	040			
NOON	99	4 St-cu Cu-nb	9 10	9599 od	0	20 SW	3 3	50 –	9 9	68 68	021 24	10.00	Wind backed to S.W. force 6	
4														

Figure 2.—Coded Log (the code figures are written in pencil above the original observations).

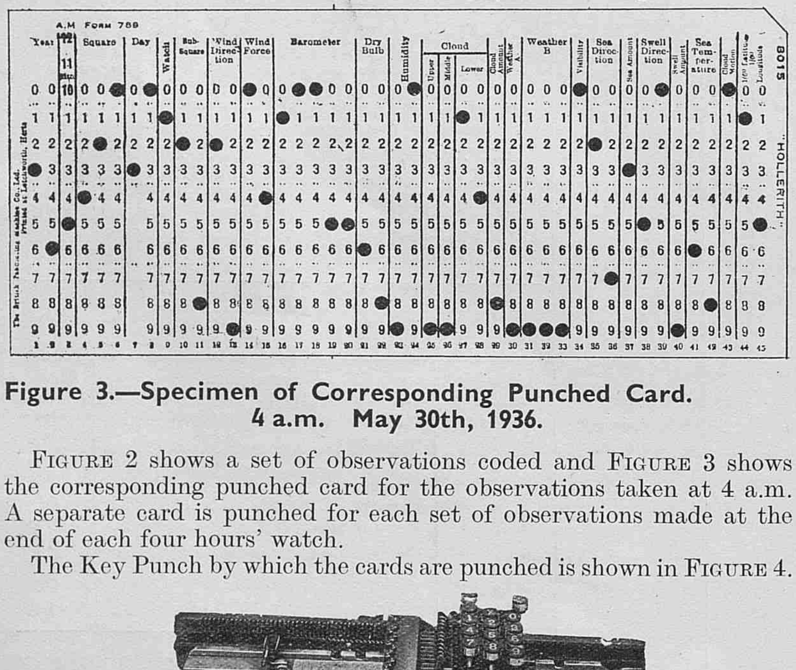


Figure 3.—Specimen of Corresponding Punched Card. 4 a.m. May 30th, 1936.

FIGURE 2 shows a set of observations coded and FIGURE 3 shows the corresponding punched card for the observations taken at 4 a.m. A separate card is punched for each set of observations made at the end of each four hours' watch.

The Key Punch by which the cards are punched is shown in FIGURE 4.

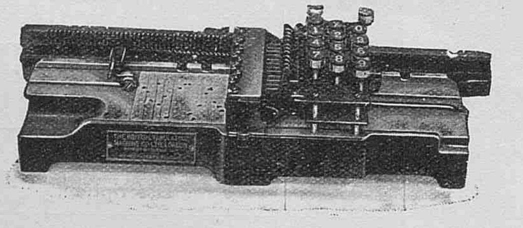


Figure 4.—Card Key Punch.

It is a small machine with a keyboard resembling that of a miniature typewriter. A card is inserted in the machine and, as each key is depressed, a hole is made in the card at a point where the corresponding number appears on the card and, with the release of the key, the card is automatically carried along so that the next column, or field as it is called, comes into position for punching. When the cards are punched they can be verified by being repunched on a "check-punch." On this check-punch machine if a key is depressed for which a corresponding hole has not been previously punched on the card, the machine locks, indicating that an error in punching has been made.

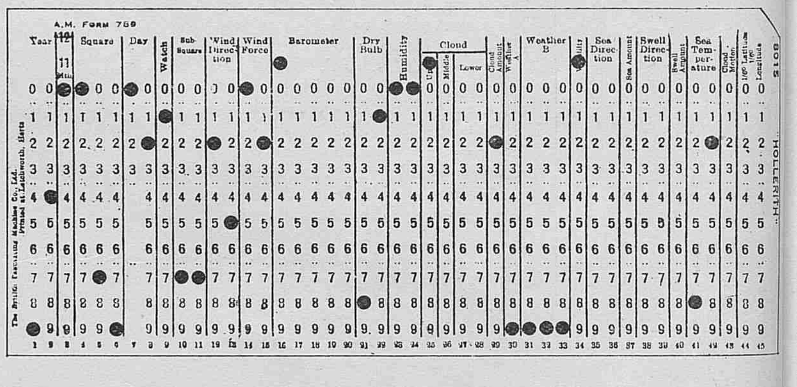


Figure 5.—Abbreviated Card, Wind, Air and Sea Temperature, Humidity, Cloud amount and Weather only.

Work on these arrears was commenced on the 2nd January, 1933, and the staff of the Marine Division is now being strengthened by the addition of a number of clerical assistants and it is hoped to complete the extraction on to Hollerith cards of data for the Pacific and North Atlantic Oceans in about two years.

Following on this successful experiment of coding and punching in one operation the observations on to the abbreviated card, the Marine Division has taken over all its own punching work and it is found that instead of having to insert all the code figures shown in FIGURE 2 for the punching of a full card a trained clerical assistant has only to insert the Marsden squares and compute the humidities where necessary, otherwise the observations are coded at sight as the card is punched. Thus a further speeding up of the rate of extraction has been achieved.

On the 31st March, 1936, 978,820 full sets of observations all over the oceans, 347,094 abbreviated sets of observations in the Pacific and North Atlantic oceans, had been punched on to Hollerith cards. The total number of cards punched and the distribution of the observations is shown on Marsden charts published in the July number each year.

Stowage of Cards.

To be easily workable it is necessary that the punched cards should be stowed so that the observations can be readily located for position and date. Since 1867 the method used to identify the position of an observation in a manner least liable to confusion and error has been to locate it in its 10° square, numbered after the plan devised by Marsden, and its subsquare, as explained in the code.

When, therefore, the cards for a batch of logs are punched, they are sorted into months. The cards for each month are sorted first into 10° squares according to the figures in columns 4, 5 and 6 and, since the averages of many elements are computed in 5° squares, the subsquare (columns 10 and 11) are sorted into groups *a*, *b*, *c*, *d*, each group comprising a 5° square as shown in FIGURE 1.

The cards are stored in wooden boxes, each of which will hold about 2,000 cards, and kept in locked cupboards in a special store-room. It is essential that the cards should be kept as free from dust as possible, as dust tends to destroy the edges of the cards and spoil them for use in the sorting and tabulating machines.

The Compilation and Computation of Marine Meteorological Data.

The sortings described above for stowing the cards are carried out by the Electrical Sorting Machine shown in FIGURE 6.

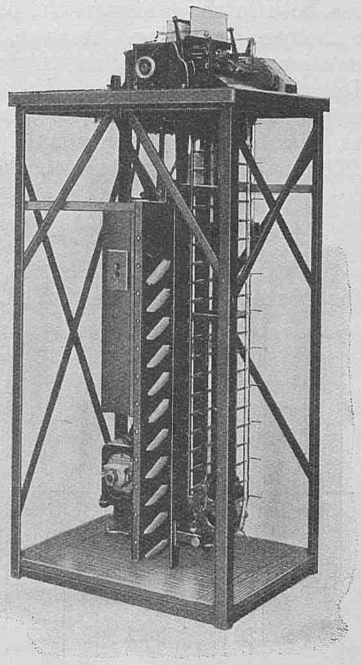


Figure 6.—" Hollerith " Electrical Sorting Machine.

This machine sorts the cards at the rate of 10,000 per hour, while for large sorting jobs there is a horizontal sorter which sorts at the rate of 24,000 cards per hour.

A pack of punched cards is placed at the top of the sorter. When the motor is started, each card is brought down in front of a magnetic brush. Where holes are punched in the card, the electric current passes through and opens a channel down which the card is carried on a revolving belt into the appropriate compartment. The twelve numbered compartments are situated up the front of the machine. The whole of one column is therefore sorted each time the cards are run through the machine. Thus all the cards for a certain Marsden square for a given month can be collated together. By further sortings, the wind can be grouped under direction and force for the construction of wind roses. The highest and lowest recorded readings of instrumental observations can be obtained by sorting the appropriate columns and frequencies of different types of weather can be grouped in a short time. By the use of this machine the frequency of the occurrence of one condition with the occurrence of another, as for example the occurrence of fog with winds from certain directions, can easily be ascertained.

For the computing of averages, the third machine, the Electrical Tabulating, Printing and Listing Machine (FIGURE 7) is used.

In this machine the electric current passing through the holes in the card operates a number of counters and, by a process too complicated to be described here, the columns are added up and the number of cards counted. Thus, if the machine is set for columns 16, 17, 18, 19, 20 and the cards for a 5° square run through, the total of the barometer readings and the number of observations will be available in a few minutes. A simple division and the mean barometric pressure for that 5° square has been obtained.

Tabulating machines can also be obtained which are fitted with a printing attachment (shown on the right hand side in FIGURE 7), something after the nature of a typewriter, whereby the cards running through the machine are not only added and counted, but the actual figures punched on each card are printed on paper, several copies being made at once if so desired.

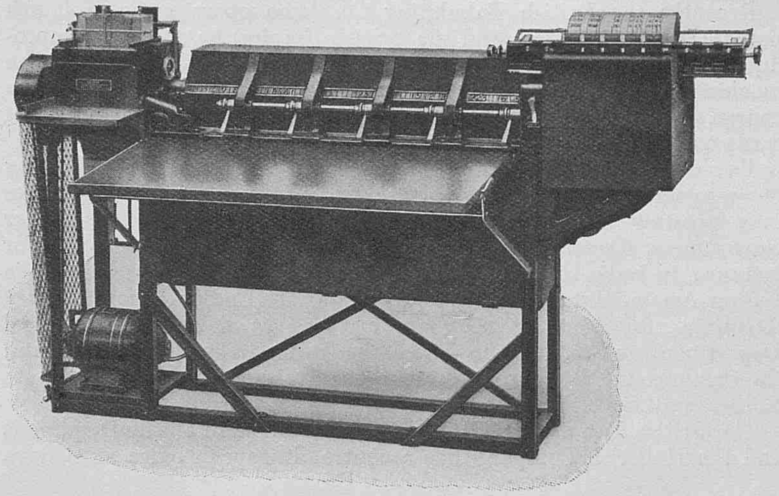


Figure 7.—" Hollerith " Electrical Tabulating, Printing and Listing Machine.

It is in the process of sorting and computation that the great saving of time and labour is effected. While the punching of observations on to cards has relieved the deadly laboriousness of the old method of copying data, the time required to completely extract the observations in logs on to cards is necessarily fairly protracted. Since it is quickest in the long run to handle each log once only, it follows that the punching of all the observations to be used must be completed before compilation and computation for the construction of charts can commence.

Once the whole of the punching is completed, the production of data for making the charts can be accomplished in a comparatively short time.

It has been possible, however, to carry out test investigations to ensure that the Hollerith System is a satisfactory one, and at the same time produce valuable information for the benefit of seamen. Using this system, tables of corrections for the diurnal range of the barometer have been computed for the North and South Tropics. A wind rose for the south-west approaches to the Channel with the frequency of fog occurring with each wind direction for all months of the year and similar wind and fog roses for the approaches to Table Bay and the ocean regions to the N.W. and S.E. of the Panama Canal have been published. Charts of cloudiness over the Trans-North Atlantic Tracks and charts showing the percentage frequency of fog and mist for the same areas have appeared in THE MARINE OBSERVER. These are a few examples of work that has been done with the Hollerith machines. With the completion of the extraction of data in sight it would be unwise and uneconomical to attempt further investigations in the meantime.

The Supply of Marine Meteorological Data to other Meteorological Services.

One of the immediate advantages of this system of data extraction, and one not foreseen at the time of its adoption, is the facilities it offers in the supply of British marine meteorological data to other countries. Previously if any other country desired to obtain British marine meteorological observations—and there is a steadily increasing demand for them—it was only possible to supply the information by laboriously copying the observations from the meteorological logs, a process which occupied a considerable amount of time and consequently hampered and impeded the general work of the Marine Division. When the required observations were available on cards it became possible to send the observations abroad by simply sorting out the requisite cards, packing them securely in a box and posting them.

This has been successfully carried out and cards have been safely sent to and returned from Holland where the mechanical system is also in use. The recent atlas of the China Seas published by the Dutch Meteorological Office contains many British observations which have been incorporated in this way.

There is, however, always the danger of the cards being lost in transit and, once lost, it would entail much time and labour in the Marine Division to replace them.

Recently the British Tabulating Co. (who operate the Hollerith patents in Great Britain and the British Empire) have made a reproducing machine whereby punched cards can be duplicated. The machine reproduces about 5,000 cards per hour. There is a service charge of 7s. 6d. per hour and, of course, the cost of the additional cards used, which is 6s. 9d. per thousand cards.

The difficulty of handling the punched cards when received by Meteorological Services who themselves have no Hollerith machines may possibly be overcome by a mutual arrangement with other Government Departments where the machines are installed. For instance, in India these machines are used by the State Railways, the Indian Army Military Pay Accounts, and the Indian Army Factory Accounts. In Australia they are installed at the State Statistical Department at Canberra, in Africa the State Railways use them and the Customs at Pretoria. In Kenya, the Treasury, Customs and State Railways all have these machines.

The British Tabulating Machine Co. have offices in all the Dominions and the Hollerith Company has a central European office at Geneva and they are always ready to advise and, in some instances, to undertake analyses of cards.

There is another method of supplying observations from Hollerith cards and that is by the Printer Tabulator. This is the tabulator mentioned above with the printing attachment. By this means the actual observations punched on the cards are listed in figures. Requests for data from Germany have been supplied in this manner. A specimen of listed observations is given in FIGURE 8. When applying for observations, the elements required should always be specified to avoid unnecessary waste of time in setting up the machine.

This method has again, of course, the great advantage of not risking loss of the original cards in transit to and from another country.

The Completion of Data Extraction.

After sixteen years endeavour, the completion of the extraction of data is at last in sight and should be accomplished in about two years. The Marine Division looks forward to the compilation and computation of the data and the construction of uniform meteorological charts of the oceans as outlined in Chapter VIII of the HANDBOOK OF WEATHER, CURRENTS AND ICE FOR SEAMEN, so that the results of eighty years' work at sea may be presented in a form that will benefit seamen and aid navigation. The use of the mechanical system of data extraction has done much to make this possible.

In conclusion, grateful acknowledgment must be made to the care which is given at sea both in the taking of the observations and the neat entries in the meteorological log. A clear, legible and correct entry of the observations is a very great factor in the speed of extraction on to Hollerith cards. The fact that data extraction has been gradually speeded up is largely due to the excellent way the voluntary work at sea has been continuously improving, since reorganization in 1920, in the keeping of meteorological logs.

Observations South of Latitude 60° S. extracted on to Hollerith Cards from the Meteorological Log of R.R.S. *Discovery II.*

Year	Month	Square	Day	Watch	Sub-Square	Wind		Barometer	Dry Bulb	Clouds				Weather A.	Weather B.	Visibility	Sea Direction	Sea Amount	Swell Direction	Swell Amount	Sea Temperature	Upper Cloud Motion
						Direction	Force			Upper	Middle	Lower	Cloud Amount									
32	1	518	18	2	72	19	04	9921	30	9	9	19	9	9	999	8	19	2	99	0	30	0
32	1	518	18	3	82	19	05	9931	25	9	9	19	9	9	149	8	19	2	99	0	29	0
32	1	518	18	4	82	19	05	9911	24	9	9	19	9	9	999	8	19	2	99	0	30	0
32	1	518	18	5	82	19	04	9908	22	9	9	19	9	9	999	8	19	2	99	0	28	0
32	1	518	18	6	93	19	03	9896	21	9	9	19	9	9	999	8	19	1	99	0	30	0
32	1	518	19	1	93	19	04	9889	22	9	9	13	7	9	999	8	19	2	99	0	30	0
32	1	518	19	2	93	19	04	9895	21	9	9	13	7	9	999	8	19	1	99	0	30	0
32	1	518	20	1	84	21	02	9895	22	9	9	19	9	9	999	8	21	1	99	0	27	0
32	1	518	20	2	84	99	01	9901	29	9	9	19	8	9	999	8	99	0	99	0	29	0
32	1	518	20	3	84	21	03	9907	28	9	9	19	9	9	999	8	21	1	99	0	29	0

Figure 8.—Specimen of Observations listed from Hollerith Cards.

A BRIEF HISTORY OF THE ROYAL NAVAL RESERVE.

By Commander M. Cresswell, R.N.R. (Retired).

When we contemplate the organization and personnel of the Royal Naval Reserve as we know it to-day, it is a far cry back into the pages of history to consider the beginnings of the war marines or navies of nations. These must have largely consisted of ships armed by merchants to protect their business of trading, as well as vessels fitted out for purely aggressive operations. In every case, right through the ages it is obvious that the merchant seaman has acted as a reserve, both in personnel and material, to the naval ships of his country.

The Royal Naval Reserve, consisting as it does of merchant seamen trained so that they can usefully augment the fleet in time of war or national emergency, it is of interest to very briefly trace the growth of the Royal Navy, together with the association of the Merchant Marine with it.

In Egypt, the Pharoah of about 2,800 B.C. built a great fleet which it is recorded brought back oversea some 7,000 prisoners of war, as well as 200,000 head of cattle, and carried from Lebanon 40 shiploads of cedar logs. The Phoenicians also fitted out hundreds of armed vessels for the protection of their commerce and colonies from piracy. The early Greeks and Persians built up enormous fleets, which were later followed by the navy of the Roman Empire. The Romans, however, were never a truly maritime people and, by the erection of towers upon the decks (the origin of "forecastle") and grappling irons, converted a sea fight as nearly as possible into a land engagement.

One interesting thing the Romans have left to us is the device we call the Naval Crown, consisting of a rim of gold adorned alternately with ships' bows and square sails. According to tradition this goes back to the Emperor Claudius who instituted it after the conquest of Britain.

For the first nine centuries of the Christian era, Norsemen and Moorish pirates scoured the European waters, as no country possessed a navy of any importance; thus battles by sea ceased for the time to decide the fate of nations. The mediæval navies of Venice, Genoa and Aragon confined their efforts to the narrow limits of the Mediterranean, and regarded ships as a means, not an end, as vessels rather of transport and commerce than of conquest and discovery; consequently their galleys were little, if at all, superior to the vessels of the ancients. The discovery of the compass, the application of artillery to naval warfare and the opening of ocean-wide navigation gave an immense impulse to the formation of navies.

The beginnings of the British Navy are usually traced back to the time of Alfred the Great, who organized a fleet for the defence of our coasts, and which several times defeated the Danes. His policy was sustained by his successors, and William I in 1066 established the Cinque Ports (originally Dover, Sandwich, Romney, Hythe and Hastings), endowing them with valuable privileges, on condition that they should act as a naval reserve by placing at the disposal of the Crown, in case of foreign war, 52 ships carrying 24 men each. Later, it became the custom for great landowners and rich towns to increase this comparatively small force by equipping ships at their own expense, manning and victualling them, and maintaining them efficiently whilst at sea. English ships had so increased in number that when Richard I started on his crusading expedition he took with him no less than 100 large ships and 50 galleys. King John claimed the right, in times of need, to arrest ships and to impress mariners into them. He also claimed for England the sovereignty of the seas, and demanded that the ships of other nations should always strike to the English Flag. This claim must have been the cause of many sanguinary conflicts, and one memorable occasion occurred when the English Lord High Admiral compelled the Spanish Fleet, which had on board Philip of Spain on his way to marry Queen Mary, to strike colours and lower topsails as a homage to the English Flag.

Passing over the numerous sea fights under our Plantagenet Kings brings us to the reign of Henry VII, when the Royal Navy commenced its permanent existence. His successor, Henry VIII, established dockyards at Deptford, Woolwich and Portsmouth, created an Admiralty and Navy Board, and divided the personnel of the Navy into Admirals, Vice-Admirals, Captains and Seamen. Of the effective fleet of fighting ships built in his reign the most famous was the *Henri Grace de Dieu*, or more popularly the *Great Harry*. She was a four-master of 1,000 tons burden, with high sides, huge fore- and after-castles, carried broadsides of great cannon and was manned by 700 men—a very great advance in fighting ship development. During the reign of Queen Mary the Navy dwindled away, and as a result England lost Calais. Queen Elizabeth quickly mended matters, her policy being to provide in all points for war that she "might the more quietly enjoy peace."

The so-called "Invincible" Armada of Spain which set forth to conquer England consisted of 130 ships and some 32,000 men, to oppose which the Royal Navy possessed only 34 ships and 6,000 men. To this force, however, the country's reserve of ships and seamen was quickly added so that the English force finally numbered 181 ships (many of them only small craft), manned by 17,000 men. Following the defeat of the Armada the building of a powerful Royal Navy became Elizabeth's great aim and, says Camden, "The wealthier inhabitants of the sea-coast, in imitation of their Princess, built ships of war, striving who should exceed, insomuch that the Queen's Navy, joined with her subjects' shipping, was in a short time so puissant that it was able to bring forth 20,000 fighting men for sea service."

The ships of the Royal Navy appear to have been first classified into rates in 1626, when Charles I issued the "new rates for seamen's monthly wages, according to his Majesty's several rates of ships and degrees of officers." They were six in number, the first being 100 to 60 guns.

Following the Civil War, during which the Navy had again greatly diminished in strength, that great ruler Cromwell in five years raised it from a position of impotence to a height of power which it had never before reached, and the English fleet which crushed Van Tromp in 1653 numbered 105 men-of-war. Charles II diverted the money designed for the use of his navy to other purposes, so that during his reign the Dutch were enabled to take possession of the Medway and ravage the English coast, while the few ships of the Navy, destitute of stores and ammunition, were unable to effect anything.

Under James II, the Royal Navy was once more restored, and the Admiralty organized much on the same plan as still prevails. From this time onwards each reign saw a steady increase in the number of ships and men of the Royal Navy, until in 1810 this force consisted of 1,048 ships carrying 140,000 men. Ships were, however, still being built on the old lines, and Nelson's *Victory* differed in no essential points from the *Great Harry*.

The manning of the Royal Navy during the long period of the Napoleonic wars must have been a difficult matter, and impressment was largely resorted to, the severity depending upon the needs of the times. The popular idea of a man-of-war's "lower deck" of a century ago is that it was inhabited by a ship's company which had been largely captured by the press-gang, and was only restrained from revolting by the presence of a detachment of marines.

The origin of the term "press" is an interesting one, as the word has, properly, no relation to the use of force. "Prest money" was so called from the French word "prest"—that is, "readie money, for that it bindeth all those that have received it to be ready at all times appointed." A prest man was really a man who received the prest of 12 pence as a soldier, when enlisted. Impressing, or more correctly impresting, that is paying ernest-money to seamen by the King's Commission to the Admiralty, was a right of very ancient date.

During the years 1811 to 1813 the press-gangs provided 29,405 men for the Royal Navy, but in that same period 27,300 deserted. Also some 3,000 useful seamen were working in the press-gangs who would have been far better employed afloat. The cost, too, of the system was found to be astounding. These figures show that the system of supplying men to the Royal Navy by force was doomed to failure, and we can, in view of the above, the better understand that old saying, "A volunteer is worth two pressed men."

A further difficulty in the manning of the Royal Navy was that only a small proportion of pressed men could have been seamen, for the reason that the crews of British Merchant Ships contained an appreciable proportion of foreigners (and did right up to the time of the Great War), and as such foreigners were exempted from impressment, it would follow that many of the seamen "raised" for the Royal Navy must have consisted of landsmen, fishermen and boys, as the Merchant Service proper could not possibly have satisfied the Navy's immense demand for British seamen, and still continued to carry out its ordinary functions.

The manning of ships largely by untrained crews sometimes led to serious results, as the following instance will be sufficient to illustrate. In August, 1812, the British frigate *Java*, manned almost entirely by raw landsmen, was in 30 minutes reduced to a sinking condition and captured, owing to the smart handling and superior gunnery of the American ship *Constitution*. The *Java* lost over 100 men killed and wounded during the action, and the *Constitution* only 14.

In 1852 what was termed the "Continuous Service System" was introduced into the Royal Navy, and under it seamen were engaged upon certain advantageous stipulations to "enter" for a period of ten years. This plan cannot, however, be said to have worked satisfactorily, nor to have given the country such a body of well-trained and efficient seamen as was anticipated.

SIR JOHN PAKINGTON, First Lord of the Admiralty at that time, himself admitted that "even with all the inducements held out, the Queen's service has been hitherto unpopular with the great body of sailors." He also mentioned many instances of ships detained in harbour for periods as long as four and even six months before completing their crews.

Although not strictly speaking a Naval Reserve, some mention should perhaps be made of a force raised in 1798 and known as the Sea Fencibles. The recruits consisted of coasting seamen, fishermen and longshoremen, and were trained in gunnery for coast defence. In 1805 the force numbered 30,000 men, but was never used for any effective purpose and was finally disbanded at the termination of the Napoleonic wars. A somewhat similar force was also raised in 1853 and known as the Naval Coast Volunteers, but these men were actually taken to sea or on board ships in harbour for training. Consisting mostly of inshore fishermen and dock workers, they flourished for some 20 years, until abolished in 1873.

In 1858 a Royal Commission was appointed to inquire into the manning of the Royal Navy, in consequence of the poor result of the appeal for recruits for the Baltic Expedition. The Majority Report approved the Continuous Service System as long as the country was not at war, but decided that it was necessary to maintain a reserve of seamen, and suggested that this should be provided from the Merchant Service. The Report concluded with the observation that—

"Your Majesty possesses in the merchant service elements of naval power such as no other government in the world enjoys. It is true that hitherto no sufficient organization has existed for securing to your Majesty the immediate command of these resources. During a long peace, reliance has been placed, either on the improbability that danger would arise, or on the efficacy of impressment to furnish the means by which danger could be confronted and overcome. Changes in public sentiment, and in the circumstances of the case, have shaken that reliance. We rejoice to believe that, by improvements in the administration of your Majesty's Navy, and in the regulation of the Merchant Service, other resources have in the meantime been placed within the reach of your Majesty's Government, and that it is now in their power to substitute for untrained service a system of defence, voluntary, effective and calculated to draw closer to your Majesty at the moment of danger, the loyal enthusiasm of those on whom your Majesty will rely. We therefore humbly and confidently submit to your Majesty the adoption of measures which, while their primary object is the protection of this country from the hazards of war, must at the same time improve the position and elevate the character of the British seamen in the two services, and unite them together in the firm bonds of reciprocal good feeling and of common interest."

By the Royal Naval Reserve Act of 1859, her Majesty was empowered to establish a reserve force of volunteer seamen for the Royal Navy, under regulations which were to be framed by the proper authorities. Most of the credit for forming the Royal Naval Reserve goes to the DUKE OF NORTHUMBERLAND and LORD CLARENCE PAGET, as they carried the measures through Parliament; but to Captain J. H. BROWN, R.N., the first Registrar-General of Seamen and a veteran of Trafalgar, also goes much credit, as he had far more to do with it than most people realize. His knowledge of the requirements of the fleet, together with his experience as Registrar, of the difficulties to be overcome, proved to be of the greatest value.

Much confusion exists in old records, as in the early days the force was sometimes called the Royal Naval Reserve, and at others the Royal Naval Volunteers. The latter was, however, a provisional title, which soon gave way to that of the Royal Naval Reserve.

Able-bodied merchant seamen with at least five years' service at sea and under 40 years of age were eligible to join, and by the end of 1861 some 5,000 men had enrolled, which was considered a quite satisfactory state of affairs.

At this time there were Coastguard depot ships at various ports round the British Isles, and both the Royal Naval Reserve and the Naval Coast Volunteers previously mentioned, carried out their drill in these ships; by no means a good arrangement, as the Coastguard Service was by way of being a backwater of the Royal Navy, and there was little enthusiasm in the Coast Volunteers, consequently the Royal Naval Reserve men had little incentive to make themselves efficient during their 28 days' training period, which, to make matters worse, they performed in their ordinary clothes.

In 1861 a Bill was passed known as the Royal Naval Reserve Officers' Act. Its sponsor, the DUKE OF SOMERSET, pointed out that in case of war there was not nearly sufficient lieutenants for the Royal Navy, which was the view generally accepted by those best acquainted with the Service. The regulations first proposed were undoubtedly very stringent, as to qualify for the rank of lieutenant, a Merchant Service officer had to possess a Master's Certificate, have had command of a ship of not under 500 tons for not less than two years, be under 45 years of age and to be actually serving afloat. Sub-lieutenants were required to be 35 years of age, to hold a certificate as Master or First Mate, and to have sailed as Master or Chief Officer in vessels of not less than 500 tons for not less than two years.

The rank of Engineer, R.N.R., was also introduced, and applied to Chief Engineers, fully qualified. All applications for the appointment and training of officers had to be made through the Board of Trade, who forwarded them to the Admiralty.

Uniform regulations for officers were laid down which, except for minor matters, are practically the same as hold to-day. The waved lines intercepting one another were of thick Russian braid and the buttons and cap badge had the letters R.N.R. superimposed upon the anchor.

The seamen of the Reserve were already receiving an annual retaining fee, and this system was also adopted in the case of officers, all other conditions of pay being as for corresponding ranks in the Royal Navy when performing training or on active service.

At the same time provision was made for the appointment of Honorary Officers, R.N.R. Owners of seagoing yachts of over 20 tons register, and superintendents of Mercantile Marine Offices who had served at sea as Masters were among those eligible for honorary rank. It is of interest to note that the first R.N.R. Commission was that of Honorary Lieutenant, and was granted on 22nd February, 1862, to CHARLES JUDKINS, the Commodore of the Cunard Line.

Both officers and men were required to perform 28 days training annually, and the old system of putting the Royal Naval Reserve and Naval Coast Volunteers into the Coastguard ships soon proved itself unsatisfactory, so that, in 1865, eight purely Royal Naval Reserve Drill Ships were stationed at the various ports, two of the best known being H.M.S. *Eagle* in Salthouse Dock, Liverpool, and H.M.S. *President* in the West India Dock, London.

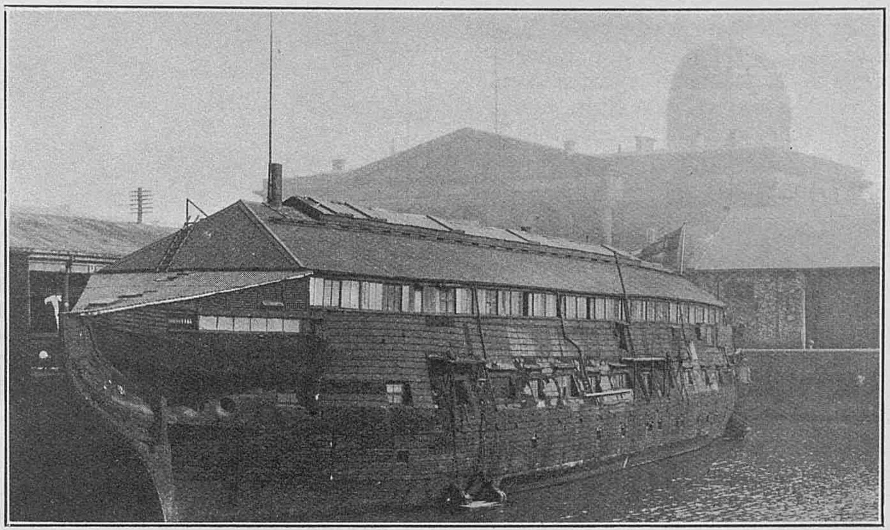
Notwithstanding the high qualifications required, there were a large number of applicants for commissions as soon as the regulations were published. These provided under the 1863 Act for a total of 500 officers, viz.: 130 Lieutenants, 270 Sub-Lieutenants and 100 Engineers, each grade ranking with, but after, the corresponding ranks in the Royal Navy.

The old Red, White & Blue Squadrons in the Navy were abolished in 1864, and the whole of the Navy flew the White Ensign. In the regulations that followed this change it was provided that the Blue Ensign could be worn by ships commanded by Royal Naval Reserve Officers which had at least a third of their crew in the Reserve, an Admiralty Warrant being obtained in every case.

By the summer of 1866 it was found that 17,000 lower-deck ratings were then enrolled in the R.N.R. Rear-Admiral JOHN TARLETON, Comptroller-General of the Coastguards was in supreme command of the Reserve, and, being required to report to my Lords of the Admiralty on the Royal Naval Reserve, considered the relative value of the men as compared with the ratings in the Royal Navy. In his estimation 1,250 men were fully competent to undertake the duties of petty officers in the Navy and 1,800 those of leading seamen. 4,800 were able seamen of satisfactory ability and the remainder were fair. He remarked that the behaviour of the Reservists was very good. The Royal Naval Reserve as an organized force was now properly launched and under way!

In 1869 the Royal Naval Reserve saw actual service in the fleet, 12 officers and 1,700 men being embarked for a cruise of two weeks, and on this occasion the men were supplied with uniform, which practice was afterwards continued, contributing greatly to the efficiency of the force.

This cruise passed off very successfully and ended by the ships gathering in Tor Bay and being inspected by the First Lord, who reported that all concerned had been more than satisfied with the performance of the Reservists.



H.M.S. " Eagle " in Salthouse Dock, Liverpool.

The rank of Midshipman, R.N.R., was introduced in 1872, a certain number of the Cadets in the *Conway* and *Worcester* being selected by the Admiralty each year from then onwards. Later the appointment of Midshipman was also approved in the case of Apprentices who had not served in either of these training establishments.

Unfortunately there appears to have been a good deal of dissatisfaction as to conditions in the Royal Naval Reserve about this time, for in 1856 there had been 17,000 men in the Reserve, while in 1873 there were only 12,000. There can be little doubt that, in spite of the progress made in building up the Reserve, there still existed in some parts of the Merchant Service a deep objection to any co-operation with the Navy, probably a heritage from the old days of the press gang. In 1876 better inducements were provided, also an Admiral Superintendent of Naval Reserves was appointed, the first to hold this office being Rear-Admiral AUGUSTUS PHILLIMORE.

H.R.H. the PRINCE OF WALES, afterwards KING EDWARD VII, in March, 1877, became the first Honorary Captain R.N.R., and thus the prestige of the Royal Naval Reserve was greatly advanced. KING EDWARD VII took a very great interest in the force, both then and after he had ascended the Throne. By 1880 the numbers had again risen to well over the 17,000 mark, in addition to a considerable gain in general efficiency.

The Accountant branch of the R.N.R. was first opened in 1882 by the appointment of Registrars as Honorary Paymasters, but the entry of Paymasters and Assistant Paymasters, R.N.R., actually appointed for duties as such, was not introduced until a much later date.

The Egyptian War that followed the bombardment of Alexandria in 1882 did some good to the Reserve, as the work done by the transports commanded by R.N.R. officers was considered particularly good and led to the proposal to promote a certain number of them to the rank of Commander R.N.R.

In 1885 when relations were very strained with Russia and war seemed imminent, a number of merchant ships were converted and commissioned as auxiliary cruisers, the greater part of their crews being Royal Naval Reservists. A reserve of mercantile firemen was also formed, as Stokers R.N.R., the men receiving a retaining fee without, however, any liability to perform training in peace time.

The conversion of the merchant ships taken over proved such a lengthy and costly proceeding that an agreement was made with several steamship lines, the Cunard and White Star among others, to maintain half of their crews as R.N.R. men. Arising from this a number of merchant ships were later built with a special view for quick conversion to armed merchant cruisers, and were held at the disposal of the Admiralty. The most famous of these ships were the *Teutonic* and *Majestic*, the *Etruria* and *Umbria*.

In 1886 the R.N.R. Regulations were completely revised, the establishment of all officers increased and, what was a most important step, officers were invited to apply for a period of 12 months' training in the fleet. This measure, however, must have forcibly impressed R.N.R. officers serving that they were very much older than their Naval shipmates; and that something was seriously wrong with the R.N.R. was evident from the fact that in 1887, of the 45 Lieutenants on the list, 8 had served in that rank for over 20 years; while of 113 Sub-Lieutenants, 5 had held that rank for 20 years.

The Regulations were again revised in 1888, which gave greatly increased scope for the promotion of officers, and matters in consequence rapidly improved, so that in 1889 the number of Lieutenants had increased to 120, Sub-Lieutenants to 120, and Midshipmen to 155. A far greater number of officers were to be admitted for 12 months' training, and so the Reserve was beginning to come into its own.

The big liner companies, too, were taking a much greater interest in their personnel, and were realizing that the Reserve gave them not only increased efficiency but also a status in the estimation of the travelling public which was very desirable to them.

One of the difficulties which faced the Admiralty in keeping up the establishment of R.N.R. seamen was the continuous fall in the total number of British merchant seamen. These decreased by some 20,000 men between the years 1875 and 1890, a very serious matter both from the national and reserve point of view.

A committee of inquiry on various matters connected with the Royal Naval Reserve was held in 1891, and Admiral SIR GEORGE TRYON was appointed chairman. Known as the Tryon Committee, its Report when issued had far-reaching results, the recommendations for general improvement being in the main carried out. A great revival of recruiting, both officers and men, followed, and establishments were further increased, until in 1896 the number of executive officers reached a total of 1,500, while the Engineers was fixed at 300.

A Retired List of R.N.R. officers, on the same lines as that for the Royal Navy, was also introduced and the Honorary List was from then onwards confined to civilians connected with the advancement of the Reserve. Arrangements were also made for officers to undergo a compulsory gunnery course, and later the torpedo and other voluntary courses were added.

It being found that there was a grave shortage of executive officers it was decided to transfer 100 officers from the Royal Naval Reserve to the Royal Navy, and in 1895 this was carried out. Throughout the Service generally these officers were jocularly known as the " Hungry Hundred," and when in 1898 a second supplementary list of 50 was added, they were promptly dubbed the " Famishing Fifty."

The excellent reports which the Reservists had obtained, both at manœuvres and during six months' training, must have shown plainly that the regular Service no longer laughed at the Reserve, and in 1897 the establishment was increased to 22,000 seamen, 3,000 stokers and 300 boys.

During the 1897 Naval Review and the subsequent cruise, 647 seamen and 125 stokers of the Royal Naval Reserve were embarked, and they were—especially the stokers—excellently reported on by the commanding officers of the various ships in which they were distributed.

That splendid reserve of fishermen known as the Newfoundland Royal Naval Reserve was founded in 1900, and H.M.S. *Calypso* was sent out to St. John's to serve as a permanent training ship, special arrangements being made to let the fishermen perform their four weeks' training during the winter. Recruiting proved very satisfactory, and those who served in armed merchant cruisers, armed boarding steamers and similar craft during the Great War, will well remember the splendid boat work performed by these men.

Also in 1900 the Registrars ashore were granted R.N.R. rank in the Accountant Branch, instead of the old honorary rank which was very apt to convey a wrong impression. In 1902 it was decided to have a reserve of R.N.R. Accountant Officers, to be drawn from men who in civil life were employed in banks as accountants and in business firms. These Assistant Paymasters were to undergo a course of training on board ship, and in time of war would serve with the fleet.

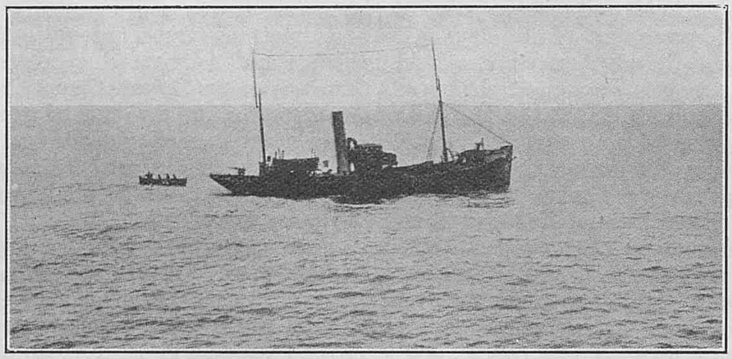
In May, 1903, was introduced the office of Admiral Commanding Coastguards and Reserves, Vice-Admiral Ernest Rice being so appointed; also at this time it was found necessary to again increase the establishment of R.N.R. executive officers to 1,600 owing to the many torpedo-boat destroyers then being added to the fleet.

As previously mentioned a certain number of R.N.R. officers who had done good work in transports during the Egyptian War received promotion to the rank of Commander R.N.R., but it was not until March, 1904, that an Admiralty Order in Council was published which created the rank of Commander R.N.R., by selection from senior Lieutenants. At the same time regulations were greatly eased regarding promotion from Midshipman to Sub-Lieutenant and Sub-Lieutenant to Lieutenant.

Between 1903 and 1905 Colonial Naval Reserves were founded in Australia, New Zealand and Malta, in addition to that started by Newfoundland in 1900. To meet the further needs of the Royal Navy a supplementary list of R.N.R. officers was again created in 1905, being on precisely the same lines as its predecessors.

In order to reward long and meritorious service in the R.N.R., the Royal Naval Reserve Officers' Decoration was established in 1909, also the award of the Naval Long Service and Good Conduct Medal was extended to the men of the Royal Naval Reserve, in each case at least 15 years' service in the R.N.R. being a necessary qualification.

The foundation of the Trawler Division of the Royal Naval Reserve in 1910 was due to suggestions made to the Admiralty by Lord Charles Beresford, who was greatly impressed by the possibility of using fishermen and their craft for mine-sweeping purposes. Experiments were strikingly successful, so that the Admiralty purchased six trawlers for training purposes, and established the rank of Skipper R.N.R. An agreement was also made between the Admiralty and a number of trawler owners for material to be available in case of need.



Armed Trawler on patrol.

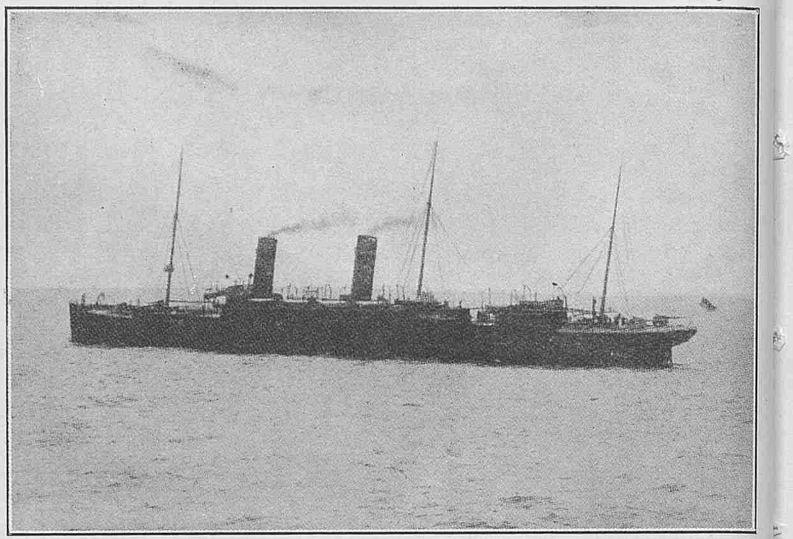
In March, 1913, the fourth Supplementary List was made by the entry of R.N.R. officers as Lieutenants and Sub-Lieutenants in the Royal Navy, the number to be limited to 100. It seems evident that in those days of rapid naval growth, all the efforts of the Admiralty to make good the shortage of junior officers from ordinary sources had proved ineffectual.

The rank of Captain R.N.R. was instituted in June, 1914, and the first four officers to be so appointed were Captain Haddock of the White Star Line, who had joined as long ago as 1877; Captain Bartlett, also of the White Star Line; Captain Charles of the Cunard Line, and Captain Owen Jones of the P. & O. Service.

On 3rd August, 1914, came the Proclamation calling out the Royal Naval Reserve to serve in the Great War. To write an account of the Royal Naval Reserve on active service would really be to write a history of the war at sea, which is beyond the scope of this article. As is well known, members of this force served in practically every type of craft, both war, merchant ship and in the air, from 1914–1918, and tackled every job assigned to it, no matter how strange or unusual.

Their war work received well-merited recognition by the award of 5,314 honours. 6,393 officers and men of the R.N.R. laid down their lives for King and Country.

The new post-war Regulations when published showed that the trust imposed in the Royal Naval Reserve had been abundantly justified, as the Admiralty had decided to retain and maintain the Reserve on much the same lines as before the war. It having previously been found impossible, and in fact unnecessary, to maintain a permanent reserve large enough for all requirements of war, only a sufficient number of officers and men to meet the needs of the fleet on mobilization would be retained, as the force could be rapidly expanded as soon as hostilities commenced.



H.M.S. "Teutonic," Armed Merchant Cruiser.

An R.N.R. Advisory Committee was formed to assist the Admiral Commanding Reserves in matters affecting the Merchant Service, thus having at his disposal ample expert advice on any subject that might come up for discussion.

One concession made in the new regulations was the greatly improved status gained by those R.N.R. officers who obtained certain specific qualifications, and became known as "qualified officers," which entitled them to rank for command with R.N. officers of corresponding rank, according to their respective seniorities and not as previously with, but after, such officers.

During the war many R.N.R. officers had served as navigators of submarines, so that it was not surprising to find special provision made for training in submarines, which service has since proved immensely popular.

The rank of Commodore, 2nd Class, was granted to a few of the senior Captains R.N.R., in recognition of particularly good service; two of the officers to be so honoured being Captain Bartlett, before mentioned, and Sir Bertram Hayes.

One minor alteration made in the uniform of R.N.R. officers was the deletion of the letters R.N.R. from cap badge and buttons, but the waved intercepting lines were retained in gold lace instead of the original thick Russian braid.

In November, 1920, H.R.H. the Duke of Connaught was appointed Honorary Captain R.N.R., and in October, 1923, he attended as principal guest at a banquet held in London, of over 300 Royal Naval Reserve Officers, under the chairmanship of Captain Sir Acton Blake, R.N.R.

Mention may also be made of the Royal Naval Reserve Officers' Club, founded in Liverpool in 1921 by Captains Richardson, Broadbent, Harris and others, with the object of maintaining and fostering the interests, prestige, status and traditions of the Royal Naval Reserve generally. The club has proved of value and continues to flourish.

A further honour conferred upon the Royal Naval Reserve has been the appointment of two of the Senior Captains on the Active List to serve as Aide-de-Camp to His Majesty the King. This was instituted by King George V, who also it will be remembered raised the status of the Mercantile Marine by the decree that it should be known as the Merchant Navy, and appointed his eldest son Master of the Merchant Navy and Fishing Fleets.

In 1935, upon the occasion of the Jubilee Naval Review, there was a goodly representation of Royal Naval Reservists embarked in the fleet assembled; and many officers of the Royal Naval Reserve, Merchant Navy and Fishing Fleets had the honour of being presented to His Majesty.

Very briefly the history of the Royal Naval Reserve has been traced from earliest times up to the present. Composed of British Merchant seamen it is a story of consistent improvement and sustained effort, and a great tradition has been built up which those serving and future generations will ever strive to uphold and improve.

COMPARISON OF THE SEVERITY OF THE WEATHER IN THE NORTH ATLANTIC DURING THE LAST SIX WINTERS.

By Captain L. A. Brooke Smith, R.N.R.

The season for winter load line laid down by the International Load Line Convention, 1930, and incorporated in the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, for the North Atlantic north of Latitude 45° N. between Longitude 15° W. and 50° W. and north of 60° N. from Longitude 15° W. to the Norwegian coast, extends from 16th October to 15th April, and for the remainder of the North Atlantic north of Latitude 36° N. from 1st November to 31st March.

In the January number last year we compared the severity of the weather during the winters 1930–1935 in the western, central and eastern portions of the North Atlantic, north of Latitude 36° N., along the trade routes, by summarizing the number of days during each month or part of the month on which gales were reported by all British voluntary observing ships at sea in those waters.

The tables and curves then published have been extended for the past winter.

During last winter they show that there was a greater frequency of gales in the eastern North Atlantic than during any of the previous five winters; though for the whole North Atlantic north of Latitude 36° N. along the trade routes, the greatest frequency remains as before, the winter of 1930–31.

On one day only during the whole of last winter was wind of hurricane force reported, that indicated for the central zone during February.

Since 1st May, 1930, there has been a fairly constant distribution of British voluntary observing ships covering the region, whose written returns have been regularly received, and though at times gales may have passed between them, such occurrences are few; so that these tables give a good indication of the number of days on which there were gales, that is wind of force 8 and above. They also indicate the number of days when the wind reached whole gale, force 10, included in the number for gale force 8; and similarly the number of days when the wind reached hurricane force.

A continuance of gales makes for the worst conditions. Wind may not only be a direct cause of damage; it causes the sea and swell, which are the chief causes of casualties due to weather.

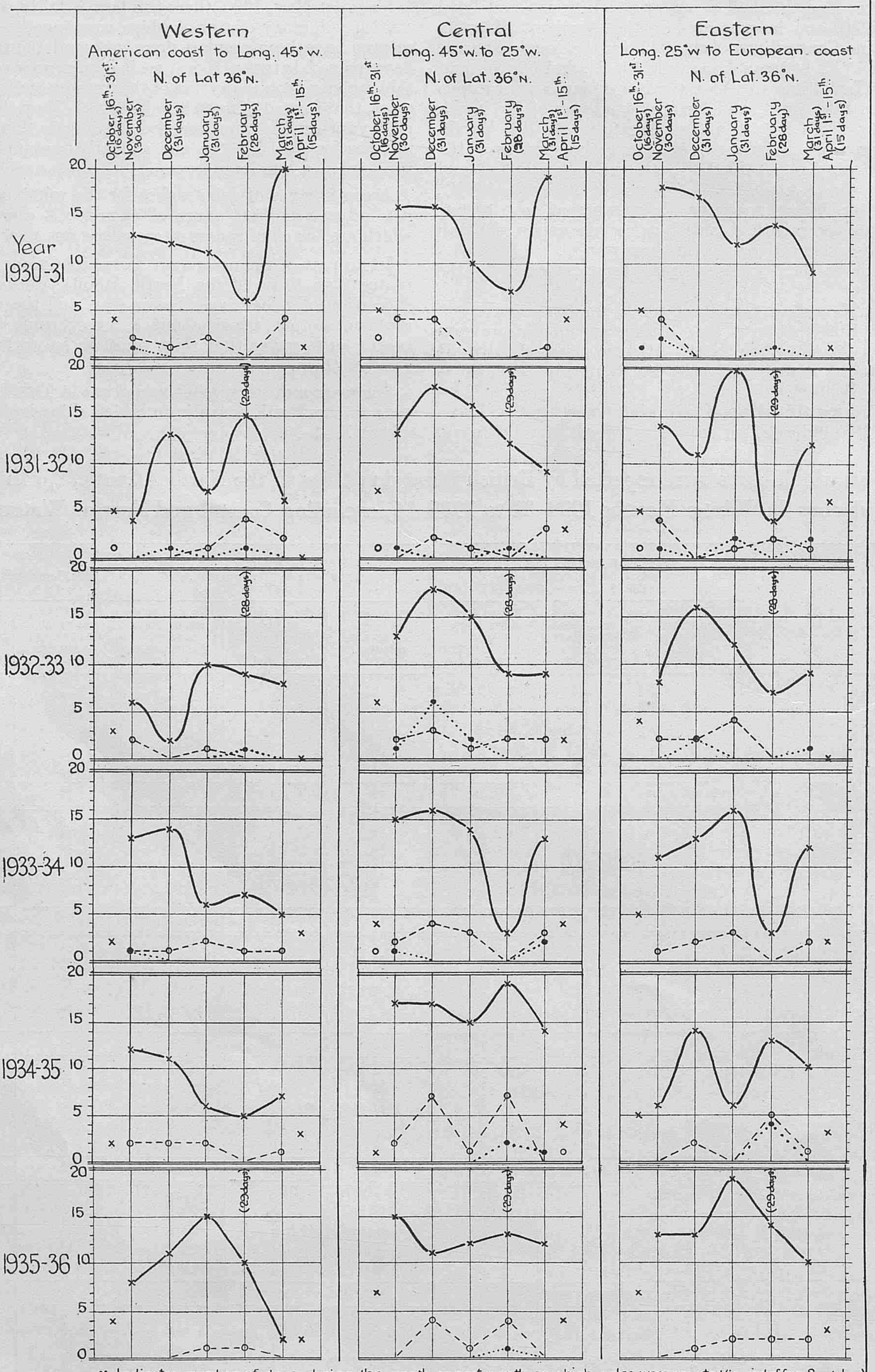
In no part of the oceans are worse conditions reported on the trade routes than those of the North Atlantic during the winter, when a succession of gales causes heavy seas, and the veering of the wind in cyclonic storms brings about a heavy confusion of sea and swell, raising such waves that ships must be seaworthy in every respect to weather them.

Some account of weather was given in The Marine Observer last year in the North Atlantic in which ships had foundered during the winter 1934–35.

Number of Days on which Gales were reported by British Observing Ships in the North Atlantic, North of Latitude 36° N. during the Winter Months 1930–31 to 1935–36, excluding Coastal and Narrow Waters.

Month.	Western. American Coast to Longitude 45° W. North of Latitude 36° N.			Central. Longitude 45° W. to 25° W. North of Latitude 36° N.			Eastern. Longitude 25° W. to European Coast North of Latitude 36° N.		
	No. of Days on which Gales were reported.	No. of Days on which Whole Gales were reported.	No. of Days when wind reached Hurricane force.	No. of Days on which Gales were reported.	No. of Days on which Whole Gales were reported.	No. of Days when wind reached Hurricane force.	No. of Days on which Gales were reported.	No. of Days on which Whole Gales were reported.	No. of Days when wind reached Hurricane force.
1930 October 16–31	4	0	0	5	2	0	5	0	1
November	13	2	1	16	4	0	18	4	2
December	12	1	0	16	4	0	17	0	0
1931 January	11	2	0	10	0	0	12	0	0
February	6	0	0	7	0	0	14	0	1
March	20	4	0	19	1	0	9	0	0
April 1–15	1	0	0	4	0	0	1	0	0
Total for Season	67	9	1	77	11	0	76	4	4
1931 October 16–31	5	1	0	7	1	0	5	1	0
November	4	0	0	13	0	1	14	4	1
December	13	0	1	18	2	0	11	0	0
1932 January	7	1	0	16	1	0	20	1	2
February	15	4	1	12	0	1	4	2	0
March	6	2	0	9	3	0	12	1	2
April 1–15	0	0	0	3	0	0	6	0	0
Total for Season	50	8	2	78	7	2	72	9	5
1932 October 16–31	3	0	0	6	0	0	4	1	0
November	6	2	0	13	2	1	8	2	0
December	2	0	0	18	3	6	16	2	2
1933 January	10	1	0	15	1	2	12	4	0
February	9	0	1	9	2	0	7	0	0
March	8	0	0	9	2	0	9	0	1
April 1–15	0	0	0	2	0	0	0	0	0
Total for Season	38	3	1	72	10	9	56	9	3
1933 October 16–31	2	0	0	4	1	0	5	0	0
November	13	1	1	15	2	1	11	1	0
December	14	1	0	16	4	0	13	2	0
1934 January	6	2	0	14	3	0	16	3	0
February	7	1	0	3	0	0	3	0	0
March	5	1	0	13	3	2	12	2	0
April 1–15	3	0	0	4	0	0	2	0	0
Total for Season	50	6	1	69	13	3	62	8	0
1934 October 16–31	2	0	0	1	0	0	5	0	0
November	12	2	0	17	2	0	6	0	0
December	11	2	0	17	7	0	14	2	0
1935 January	6	2	0	15	1	0	6	0	0
February	5	0	0	19	7	2	13	5	4
March	7	1	0	14	0	1	10	1	0
April 1–15	3	0	0	4	1	0	3	0	0
Total for Season	46	7	0	87	18	3	57	8	4
1935 October 16–31	4	0	0	7	0	0	7	0	0
November	8	0	0	15	0	0	13	0	0
December	11	0	0	11	4	0	13	1	0
1936 January	15	1	0	12	1	0	19	2	0
February	10	1	0	13	4	1	14	2	0
March	2	0	0	12	0	0	10	2	0
April 1–15	2	0	0	4	0	0	3	0	0
Total for Season	52	2	0	74	9	1	79	7	0

Number of days on which Gales were reported in the North Atlantic during the months and part-months of the Winters 1930 to 1936.



x Indicates number of days during the month or part-month on which gales were reported (i.e. wind of force 8 and above)
o Indicates number of days included in x when wind was reported to reach a whole gale, force 10.
• Indicates number of days included in x when wind was reported to reach hurricane force.

SOUTHERN ICE REPORTS.

During the year 1936.

January.

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1936	1	From 61° 29′ S. To 60° 46′ S.	43° 31′ E. 44° 32′ E.	2 bergs	1 small irregular, 1 tabular	R.R.S. *William Scoresby.*
	2	58° 37′ S.	46° 16′ E.	Berg	Low tabular	Do.
	4	58° 06′ S.	45° 23′ E.	Berg	Small broken down tabular	Do.
	7	60° 26′ S.	50° 29′ E.	Bergy bit		Do.
	8	61° 08′ S.	50° 58′ E.	Berg	Small irregular, 800 ft. long by 250 ft. high (sextant angles)	Do.
	9	From 62° 30′ S. To 63° 05′ S.	52° 05′ E. 52° 22′ E.	8 bergs	1 tall pinnacle berg, 320 ft. high by 800 ft. long at base (sextant angles). Remainder all small and irregular.	Do.
		From 63° 05′ S. To 63° 58′ S.	52° 22′ E. 49° 36′ E.	5 bergs, growlers and brash	1 medium size irregular, 1 small irregular and 3 small pinnacle bergs. Several large and numerous small growlers. 1 small area of brash ice.	Do.
	10	From 63° 58′ S. To 64° 06′ S.	49° 36′ E. 47° 33′ E.	Bergy bit, growler	Occasional small scattered pieces of drift ice	Do.
		From 64° 06′ S. To 64° 05′ S.	47° 33′ E. 46° 32′ E.	Bergy bit, drift ice	Encountered streams of brash and area of very light loose pack four miles to west of former position. Proceeding 280° to latter position kept on edge of area of scattered drift with streams of brash. Floes in area of loose pack first encountered were very light and mainly broken into brash by short swell running. Bergy bit close to latter position. Strong blink to southward.	Do.
		From 64° 05′ S. To 64° 11′ S.	46° 32′ E. 45° 26′ E.	Drift ice, 2 bergs, 1 bergy bit	Proceeding to westward, skirting northern edge of area of loose drift and streams of brash. 16 miles to west of former position cleared western limit of drift ice. Bergs small and irregular.	Do.
		From 64° 11′ S. To 64° 21′ S.	45° 26′ E. 42° 53′ E.	3 bergs	1 old listed tabular, 250 ft. high at highest point by 800 ft. long at base (sextant angles). One irregular of similar height, and 1 small irregular.	Do.
	11	From 64° 21′ S. To 64° 42′ S.	42° 53′ E. 39° 56′ E.	9 bergs	1 broken down listed tabular, 185 ft. high with ledge 700 ft. long (sextant angles), 1 tall pinnacle berg, 2 small pinnacle bergs, 1 very low, flat berg. Remainder small and irregular.	Do.
		From 64° 42′ S. To 63° 53′ S.	39° 56′ E. 36° 42′ E.	10 bergs, several bergy bits	1 broken down tabular. Remainder small and irregular. A few bergy bits. All within 10–12 miles of track.	Do.
	12	From 63° 53′ S. To 63° 37′ S.	36° 42′ E. 35° 24′ E.	Bergs	1 medium and 1 small irregular bergs, and several very small and worn bergs.	Do.
		From 63° 37′ S. To 63° 21′ S.	35° 24′ E. 37° 07′ E.	10 bergs, 4 bergy bits	All small and irregular	Do.
	13	From 63° 21′ S. To 63° 10′ S.	37° 07′ E. 38° 54′ E.	6 bergs, bergy bits	1 small old tabular, partly capsized. Remainder all small and irregular. Several small bergy bits and a few small pieces of drift ice.	Do.
		From 63° 10′ S. To 62° 57′ S.	38° 54′ E. 40° 40′ E.	9 bergs, growlers	1 medium sized tabular, 1 old partly capsized tabular, 1 tall irregular and 6 small irregular bergs. A few growlers. Within 10 miles of track.	Do.
	14	From 62° 57′ S. To 62° 51′ S.	40° 40′ E. 42° 17′ E.	4 bergs	All small and irregular	Do.
		From 62° 51′ S. To 62° 31′ S.	42° 17′ E. 44° 43′ E.	2 bergs, 2 growlers	Bergs both very small. 1 low and sea worn	Do.
	15	From 62° 31′ S. To 62° 21′ S.	44° 43′ E. 47° 00′ E.	4 bergs, 2 growlers	1 small old tabular, tall and listed. Remainder small and irregular. 1 very small and sea worn.	Do.
		From 62° 21′ S. To 62° 03′ S.	47° 00′ E. 48° 24′ E.	7 bergs, 2 bergy bits	1 small old tabular. Remainder small and irregular. Within 10 miles of track.	Do.
	16	From 62° 03′ S. To 61° 41′ S.	48° 24′ E. 50° 06′ E.	3 bergs, 1 bergy bit, growler	All small and irregular bergs	Do.
		61° 15′ S.	51° 53′ E.	Berg	Irregular	Do.
	17	From 61° 15′ S. To 62° 21′ S.	51° 53′ E. 52° 16′ E.	3 bergs, 2 growlers	Bergs all small. 1 tabular and 2 irregular	Do.
		From 62° 21′ S. To 63° 29′ S.	52° 16′ E. 52° 44′ E.	1 berg, 1 bergy bit	Small old tabular berg	Do.
	18	From 63° 29′ S. To 65° 20′ S.	52° 44′ E. 54° 24′ E.	16 bergs, bergy bits and growlers	2 small tabulars. Others all small and irregular. A few bergy bits and growlers. Within 10 miles of track.	Do.
		From 65° 20′ S. To 65° 40′ S.	54° 24′ E. 54° 43′ E.	Approximately 40 bergs, bergy bits, pack ice	All these bergs were within a radius of about 10 miles from the latter position, and nearly all to the south and south-east, i.e. between latter position and coast of Enderby Land. About 24 of them were tabulars of medium or large size, 6 being 1 mile or more in length. Vessel stopped under lee of one approximately 1½ miles long by 1 mile broad (by distance run). One to northward measured by sextant angles was 4,000 ft. long by 200 ft. high. When vessel stopped at 2300 pack ice was visible about 2 miles to south, but at midnight pack was observed approaching rapidly from S.W. and reached position of ship by 0100 on 19th.	Do.
	19	65° 36′ S.	55° 12′ E.	Bergs and pack ice	In this position at noon on 19th vessel was about 4 miles inside edge of open pack. Edge of pack running W.N.W. and E.S.E. Pack was composed mainly of small light floes and brash, but many pieces of old heavy floes, much honeycombed. All these floes were much hummocked. Numerous small worn bergs and bergy bits amongst pack. Numerous tabular bergs to southward, as above.	Do.
		From 65° 31′ S. To 65° 28′ S. To 65° 38′ S.	55° 15′ E. 55° 35′ E. 55° 55′ E.	Bergs and pack ice	Cleared northern edge of pack ice in former position and proceeded to east and south along edge till latter position was reached at 1820. Then, steering 160°, open water ahead and to the eastward, 3 small irregular bergs passed to seaward. Course then altered to 045°.	Do.
		From 65° 38′ S. To 65° 15′ S.	55° 55′ E. 57° 05′ E.	5 bergs	1 slow tabular, medium size with uneven top. Remainder small and irregular.	Do.
	20	From 65° 15′ S. To 64° 25′ S.	57° 05′ E. 59° 12′ E.	14 bergs, bergy bits	8 of these were small tabulars, 1 being old, high and listed (550 ft. long by 170 ft. high by sextant angles) and much caverned below original water line. Remainder all small and irregular. Several bergy bits.	Do.
		From 64° 25′ S. To 63° 40′ S.	59° 12′ E. 61° 45′ E.	7 bergs, bergy bits and growlers	3 small tabulars and 2 small worn and partly capsized tabulars. 2 very small irregular bergs. Several bergy bits and growlers.	Do.
	21	From 63° 40′ S. To 62° 48′ S.	61° 45′ E. 64° 25′ E.	4 bergs, 5 bergy bits	3 small tabular and 1 small irregular bergs. 1 bergy bit partly bottle green.	Do.
		From 62° 48′ S. To 61° 48′ S.	64° 25′ E. 66° 51′ E.	1 berg, 2 bergy bits	Pinnacle berg, 220 ft. high by sextant angle	Do.
	22	From 61° 48′ S. To 60° 41′ S.	66° 51′ E. 68° 54′ E.	1 bergy bit and 1 growler		Do.
		From 60° 41′ S. To 61° 21′ S.	68° 54′ E. 71° 47′ E.	4 bergs, bergy bits and growlers	1 small worn tabular berg and 3 small and irregular. 2 bergy bits and a few growlers.	Do.
	23	From 61° 21′ S. To 61° 48′ S.	71° 47′ E. 75° 12′ E.	7 bergs, 1 bergy bit and growlers	2 large low tabulars (one 1 mile long by 100 ft. high, sextant angles, and one estimated ¾ mile long). 2 medium size tabulars (one 1,000 ft. long by 150 ft. high by sextant angles). Remainder small and irregular. A few growlers near former position.	Do.
		From 61° 48′ S. To 62° 35′ S.	75° 12′ E. 78° 29′ E.	22 bergs, bergy bits, growlers	15 tabulars, 6 being of medium size and 9 small. Remainder small irregular and pinnacle bergs. A few bergy bits and growlers, 2 growlers being of green ice.	Do.

SOUTHERN ICE REPORTS (*continued*).

Year	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1936	24	From 62° 35′ S. To 63° 00′ S.	78° 29′ E. 80° 43′ E.	17 bergs, bergy bits and growlers	14 tabular bergs, 3 being large (1 measured 4,000 ft. long by 150 ft. high), the remainder of medium or small size. 3 small irregular bergs. Many bergy bits and growlers.	R.R.S. *William Scoresby.*
		From 63° 00′ S. To 63° 25′ S.	80° 43′ E. 82° 55′ E.	114 bergs, bergy bits and growlers	42 of these were tabulars, a few being long and low with uneven tops. Mostly of small or medium size and much caverned. Some slightly listed. Remaining bergs small and irregular. Many bergy bits and numerous growlers and pieces.	Do.
		From 63° 25′ S. To 63° 47′ S.	82° 55′ E. 84° 16′ E.	160 bergs and bergy bits, growlers and pack ice.	32 tabulars of small or medium size, 23 small irregular bergs, and remainder very small bergs or bergy bits. Many growlers and small pieces. Pack ice was sighted from latter position about 5 miles to S.E., extending in a N.E. and S.W. direction over about 40° of horizon.	Do.
	24 25	From 63° 47′ S. To 63° 02′ S.	84° 16′ E. 84° 16′ E.	67 bergs, bergy bits and growlers	20 tabulars (2 very long and low, estimated to be 1½ miles and ¾ mile in length). Mostly small or medium size. Remaining bergs small and irregular. Many bergy bits and growlers.	Do.
		From 63° 02′ S. To 62° 28′ S.	84° 16′ E. 84° 20′ E.	67 bergs and bergy bits, growlers	2 medium size and 5 small tabular bergs. Remainder small irregular bergs and bergy bits. Many growlers.	Do.
		From 62° 28′ S. To 61° 43′ S.	84° 20′ E. 84° 27′ E.	27 bergs, bergy bits and growlers	7 small old and listed tabulars, 18 small irregular bergs and 2 very small and sea worn. Several bergy bits and numerous growlers. Within about 3 miles of track.	Do.
		From 61° 43′ S. To 61° 26′ S.	84° 27′ E. 84° 29′ E.	32 bergs, bergy bits and growlers	20 small tabulars. Remainder irregular. Many bergy bits and growlers.	Do.
		From 61° 26′ S. To 61° 13′ S.	84° 29′ E. 84° 26′ E.	35 bergs and bergy bits, growlers	2 medium size and 4 small tabulars, 11 irregular bergs and 18 very small bergs and bergy bits. Many growlers.	Do.
		From 61° 13′ S. To 61° 06′ S.	84° 26′ E. 84° 25′ E.	42 bergs, bergy bits and growlers	2 small old listed tabulars. Remainder all small and irregular, within about 8 miles of track. Numerous bergy bits and growlers.	Do.
	26	From 61° 06′ S. To 60° 32′ S.	84° 25′ E. 84° 28′ E.	15 bergs and bergy bits, growlers	3 small tabulars. Remainder small irregular bergs and bergy bits. Several growlers. Within 5 miles of track.	Do.
		From 60° 32′ S. To 60° 18′ S.	84° 28′ E. 84° 35′ E.	8 bergs, growlers	3 small old tabulars, slightly listed, 2 small low tabulars with snow tops, uneven and hummocked, 1 irregular and 2 small sea worn bergs. Within 5 miles of track.	Do.
		From 60° 18′ S. To 59° 37′ S.	84° 35′ E. 85° 54′ E.	12 bergs, growlers	2 tabulars, one 4,000 ft. long by 200 ft. high, other small. Remainder small and irregular. Several bergy bits and many growlers.	Do.
	27	From 59° 37′ S. To 59° 24′ S.	85° 54′ E. 86° 24′ E.	14 bergs	9 of these were tabular bergs, 1 of medium size and uniform height, estimated to be 1,500 ft. long, others all small, old and, in some cases, listed. 1 measuring 230 ft. high and 600 ft. long showed narrow stratum of dark ice near top. Remaining bergs small and irregular.	Do.
		From 59° 24′ S. To 59° 21′ S.	86° 24′ E. 87° 35′ E.	10 bergs	3 small tabulars. Remainder small and irregular	Do.
	28	From 59° 21′ S. To 60° 00′ S.	87° 35′ E. 88° 49′ E.	12 bergs, 3 bergy bits	4 tabulars, 1 of medium size and others small, 2 being listed. Remainder small and irregular or worn. Within 10 miles of track.	Do.
	29	From 60° 00′ S. To 60° 08′ S.	88° 49′ E. 89° 29′ E.	6 bergs, bergy bits and growlers	1 medium sized tabular, 2,400 ft. long and 115 ft. to 165 ft. high (sextant angles), clean cut and regular. 2 old tabulars, 1 medium size and 1 small and very high, estimated to be 300 ft. high. Other 3 bergs small and irregular. Several bergy bits and numerous growlers.	Do.
		From 60° 08′ S. To 60° 45′ S.	89° 29′ E. 90° 49′ E.	Approximately 140 bergs, bergy bits and growlers.	14 small tabulars, mostly old, worn and slightly listed. Remainder all small irregular and pinnacle bergs. Many bergy bits and growlers.	Do.
	30	From 60° 45′ S. To 61° 08′ S.	90° 49′ E. 90° 18′ E.	Approximately 90 bergs, bergy bits and growlers.	A few medium size and small tabulars, but great majority small irregular and pinnacle bergs of all shapes and sizes. Many bergy bits, growlers and areas of brash.	Do.
		From 61° 08′ S. To 61° 32′ S.	90° 18′ E. 89° 28′ E.	Approximately 50 bergs, bergy bits and growlers.	6 tabulars, 1 of medium size, 3 small and uniform and 2 old and listed. Remainder all small irregular and pinnacle bergs. Numerous growlers.	Do.
	31	From 61° 32′ S. To 61° 54′ S.	89° 28′ E. 88° 33′ E.	Approximately 100 bergs, bergy bits, drift ice	All small irregular bergs. Numerous bergy bits. Small areas loose drift ice and brash.	Do.
		From 61° 54′ S. To 62° 28′ S.	88° 33′ E. 88° 16′ E.	30 bergs, bergy bits and growlers	3 medium size low tabulars with uneven tops. Remainder all small and irregular. Numerous bergy bits and growlers. 1 bergy bit partly bottle green. Small areas brash.	Do.
		From 62° 28′ S. To 62° 11′ S.	88° 16′ E. 87° 39′ E.	Approximately 90 bergs, bergy bits and growlers.	5 medium size tabular bergs estimated between 2,000 ft. and 3,000 ft. in length, 8 small tabulars. Remainder small and irregular. Many bergy bits and growlers.	Do.
	15	52° 57′ S.	29° 50′ E.	Berg	About 75 ft. high	M.V. *Havsten.*
	7	66° 48′ S.	178° 51′ W.	Loose pack ice	...	R.R.S. *Discovery II.*
	8	67° 35′ S.	178° 47′ W.	Loose pack ice	...	Do.
	9	69° 48′ S.	178° 37′ W.	Loose pack ice	...	Do.
	10	71° 30′ S.	178° 00′ W.	Loose pack ice	...	Do.
	11	71° 38′ S.	177° 56′ W.	Moored to ice floe	...	Do.
		71° 35′ S.	177° 34′ W.	Pack ice	...	Do.
	12	71° 44′ S.	178° 03′ W.	Loose pack ice	...	Do.
	13	72° 23′ S.	179° 01′ W.	Pack ice	...	Do.
	14	73° 19′ S.	179° 50′ E.	Clear of pack ice	...	Do.
		73° 38′ S.	179° 58′ E.	Occasional streams of loose pack	...	Do.
		75° 26′ S.	177° 35′ W.	Occasional streams of loose pack	...	Do.
	15	78° 05′ S.	166° 50′ W.	Edge of Ross Ice Barrier	...	Do.
	18	78° 18′ S.	174° 24′ W.	Ross Ice Barrier	...	Do.
	19	78° 21′ S.	168° 11′ W.	Ross Ice Barrier	...	Do.
	22	78° 16′ S.	165° 41′ W.	Ross Ice Barrier	...	Do.
	26	76° 40′ S.	168° 34′ E.	Drift ice	...	Do.
	27	73° 31′ S.	177° 43′ E.	Entered area of pack ice	...	Do.
	28	73° 28′ S.	177° 16′ E.	Loose pack	...	Do.
		73° 16′ S.	176° 30′ E.	Loose pack	...	Do.
		73° 15′ S.	176° 21′ E.	Large berg	Tabular, 17 miles long	Do.
		72° 50′ S.	177° 51′ E.	Loose pack ice	...	Do.
	29	72° 27′ S.	178° 23′ E.	Loose pack ice	...	Do.
	30	71° 45′ S.	178° 28′ E.	Open leads of pack ice	...	Do.
		71° 21′ S.	178° 23′ E.	Pack ice	...	Do.
		70° 32′ S.	178° 51′ E.	Clear of pack ice	...	Do.
		70° 23′ S.	178° 51′ E.	Streams of drift ice	...	Do.
	23	56° 20′ S.	141° 45′ W.	Berg and several growlers	...	M.V. *Port Wyndham.*
	24	56° 23′ S.	134° 42′ W.	2 growlers	...	Do.
	25	56° 17′ S.	130° 40′ W.	Large tabular berg	...	Do.
		From 56° 23′ S. To 56° 23′ S.	127° 30′ W. 126° 50′ W.	Berg and several growlers	...	Do.
		56° 23′ S.	124° 12′ W.	Large berg	...	Do.
	11	56° 10′ S.	148° 10′ W.	Tabular berg, very regular in shape	All dimensions by sextant angles in conjunction with 4 point bearings. Bergs to the eastward were noticeably more weatherworn and irregular in shape than the bergs to the westward.	M.V. *Port Hobart.*
		55° 59′ S.	143° 58′ W.	Berg, pyramid shaped, height 240 ft., length 950 ft.		Do.
	12	55° 51′ S.	139° 57′ W.	Berg, glacial type		Do.
		56° 22′ S.	135° 40′ W.	Tabular berg, height 500 ft. length 3,000 ft.		Do.
	13	55° 55′ S.	134° 10′ W.	Small tabular berg		Do.
		55° 40′ S.	132° 20′ W.	Glacial berg		Do.
		55° 34′ S.	132° 11′ W.	Glacial berg		Do.
		55° 44′ S.	132° 11′ W.	Glacial berg, small		Do.
		55° 53′ S.	130° 12′ W.	Growler, 10 ft. high, 60 ft. long, nearly awash.		Do. Do.
		55° 54′ S.	130° 03′ W.	2 growlers, nearly awash		Do.
		55° 50′ S.	129° 42′ W.	Tabular berg		Do.

SOUTHERN ICE REPORTS (*continued.*)

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1936	13	56° 09′ S.	129° 26′ W.	Tabular berg, height 231 ft., length 600 ft.	All dimensions by sextant angles in conjunction with 4 point bearings. Bergs to the eastward were noticeably more weatherworn and irregular in shape than the bergs to the westward.	M.V. *Port Hobart.*
		55° 52′ S.	129° 22′ W.	Tabular berg, height 180 ft., length 840 ft.		Do.
		56° 14′ S.	128° 43′ W.	Pyramid shaped berg		Do.
		55° 59′ S.	128° 42′ W.	Tabular berg, height 55 ft., length 650 ft.		Do.
		56° 01′ S.	128° 32′ W.	Growler, height 20 ft., length 50 ft.		Do.
		56° 03′ S.	128° 28′ W.	Growler, height 15 ft., length 40 ft.		Do.
		55° 58′ S.	128° 27′ W.	Growler, height 20 ft., length 50 ft.		Do.
		56° 02′ S.	128° 25′ W.	Growler, height 20 ft., length 50 ft.		Do.

February.

	2	66° 22′ S.	28° 02′ E.	Pack ice	... ...	M.V. *Havsten.*
	17	53° 00′ S.	22° 30′ E.	Berg	... ...	Do.
	1	From 62° 11′ S. To 61° 43′ S.	87° 39′ E. 87° 46′ E.	Approximately 120 bergs, bergy bits and growlers.	12 medium size and 19 small tabular bergs, 4 of the latter being very low (60 ft. to 70 ft. high) with uneven snow tops. Several very small old and listed tabulars. Remaining bergs small and irregular. Numerous bergy bits and growlers. 1 low tabular and several bergy bits with dark markings. Approximately 80 bergs visible in radius of 12 miles.	R.R.S. *William Scoresby.*
		From 61° 43′ S. To 62° 04′ S.	87° 46′ E. 89° 01′ E.	Approximately 140 bergs, bergy bits and growlers	About 15 of these were tabular bergs, 2 being large and others small or medium size. Remainder all small irregular bergs. Many bergy bits and growlers and streams of brash in vicinity of larger bergs.	Do.
	2	From 62° 04′ S. To 62° 27′ S.	89° 01′ E. 90° 06′ E.	Approximately 100 bergs, bergy bits and growlers.	A few medium size and small tabulars, but majority small irregular and pinnacle bergs. Numerous bergy bits and growlers. 1 very small old tabular (85 ft. high by 330 ft. wide) showing semi-circular portion of dark ice in interior of cavern, also veins of discoloured ice. Samples of discoloured ice obtained and melted down, leaving deposit. 1 very small berg showing horizontal veins of bottle green ice.	Do.
	3	From 62° 27′ S. To 62° 43′ S.	90° 06′ E. 91° 12′ E.	20 bergs, bergy bits and growlers	All small irregular bergs, 3 bergy bits and a few growlers. Within 4 miles of track.	Do.
	4	From 62° 43′ S. To 63° 13′ S.	91° 12′ E. 92° 32′ E.	21 bergs, bergy bits and growlers	1 old broken down tabular, 200 ft. high by 750 ft. long (sextant angles). Other bergs all small and irregular or sea worn. About 8 bergy bits and 1 or 2 growlers. Within about 5 miles of track.	Do.
	5	From 63° 13′ S. To 63° 43′ S.	92° 32′ E. 93° 38′ E.	13 bergs, bergy bits, growlers and drift ice...	3 long, low bergs (estimated to be ½ to ¾ mile in length) with cambered tops. 4 medium and small tabulars, 2 having very uneven crevassed tops and much caverned sides. Remainder small old tabulars or irregular bergs. Near latter position passed southern end of stream of loose pack about 3 miles long, running N. and S. Composed of broken and rafted remains of very heavy floes (some 15 ft. high). All much honeycombed. 3 miles to eastward another similar stream, and to the southward and eastward drift ice and streams of loose pack all composed of the same remains of heavy pack.	Do.
		From 63° 43′ S. To 63° 02′ S.	93° 38′ E. 94° 40′ E.	8 bergs, 3 bergy bits	7 tabulars, 2 large, 1 medium size and 1 small and 3 small old and listed. 1 small pinnacle berg. Loose pack and drift as above near former position.	Do.
	6	From 63° 02′ S. To 62° 59′ S.	94° 40′ E. 95° 15′ E.	28 bergs, bergy bits and growlers	10 of these bergs were tabulars, 2 being of a type of which many have been seen in this area, unlike the regular flat-topped and wall sided tabulars, their tops are cambered or slightly convex, and slope gradually from a height of about 150 ft. in centre to about 50 ft. at the sides. 1 large one of this type measured by sextant angles was 1 mile long, 140 ft. high in centre and 40 ft. high at one of the longer sides, 2 were small uniform tabulars about 600 ft. long by 120 ft. high (estimated) and 1 very low one of type previously described about 1,400 ft. long, oval in shape, with a maximum height of about 70 ft., sloping to 30 ft. or 40 ft. all round (all estimated dimensions). Another medium size tabular was of another type which is common in this area, i.e. tabular bergs with very uneven snow tops, much hummocked and crevassed, and usually slightly convex, and sides very much caverned. Remainder of bergs were small and irregular. A few bergy bits and growlers.	Do.
		From 62° 59′ S. To 62° 28′ S.	95° 15′ E. 96° 25′ E.	Approximately 30 bergs, bergy bits and growlers.	2 large and 5 medium size tabulars, 1 old broken down tabular. Remainder small and irregular. A few bergy bits and many small growlers.	Do.
	7	From 62° 28′ S. To 61° 54′ S.	96° 25′ E. 97° 36′ E.	64 bergs, bergy bits and growlers	1 medium size tabular, 1,200 ft. long by 140 ft. high (sextant angles), with much hummocked snow top. Approximately 20 being small old tabulars, mostly broken down and several listed, 1 estimated to be 250 ft. high. The remainder were all small and irregular, several being completely sea worn and probably capsized remains of old tabulars. Several bergy bits and growlers.	Do.
		From 61° 54′ S. To 61° 48′ S.	97° 36′ E. 98° 14′ E.	36 bergs, bergy bits and growlers	5 tabulars, 4 broken down old tabulars. Remainder small and irregular. Several bergy bits and growlers.	Do.
	8	From 61° 48′ S. To 61° 14′ S.	98° 14′ E. 99° 31′ E.	Approximately 20 bergs, bergy bits and growlers.	6 broken down old tabulars, 2 being partly sea worn and showing dark markings in form of veins of brown and bottle green ice. Veins running in wavy horizontal lines and showing on all sides of bergs. Remainder all small irregular and pinnacle bergs, one measured 200 ft. high. A few bergy bits and growlers.	Do.
		From 61° 14′ S. To 60° 59′ S.	99° 31′ E. 101° 09′ E.	6 bergs, bergy bits and growlers	5 old worn tabulars and 1 small irregular. A few bergy bits and growlers. Within about 3 miles of track.	Do.
	9	From 60° 59′ S. To 62° 14′ S.	101° 09′ E. 102° 17′ E.	12 bergs, bergy bits and growlers	All small irregular bergs. 1 very small one with dark markings. 3 bergy bits and 4 growlers.	Do.
	10	From 62° 14′ S. To 63° 26′ S.	102° 17′ E. 103° 47′ E.	5 bergs, 1 bergy bit and 2 growlers ...	1 small broken down tabular berg. Remainder small and irregular.	Do.
	11	From 63° 26′ S. To 64° 34′ S.	103° 47′ E. 104° 27′ E.	14 bergs, 1 bergy bit, growlers	6 tabular bergs. 2 large, 1 small and regular and 3 small old and broken down or listed. Remainder small and irregular. A few small growlers.	Do.
	12	From 64° 34′ S. To 64° 40′ S.	104° 27′ E. 103° 52′ E.	8 bergs, drift ice	2 tabular bergs and 6 small irregular bergs. 4 miles south of former position encountered loose drift ice with streams brash, and areas of newly formed pancake ice and slush.	Do.
		From 64° 40′ S. To 64° 49′ S.	103° 52′ E. 103° 18′ E.	Approximately 27 bergs, pack ice and drift	In former position, loose drift ice with small areas pancake ice, brash and sludge. 6 miles further south encountered edge of close pack extending W.N.W. and E.S.E. Fairly loose near edge and consisting mainly of small old and rotten floes with much brash and pack extending as far as visible to south with no lanes or pools visible. Edge of pack was then skirted in W.N.W. direction to latter position. All bergs except one were in this pack to S. and 17 of them were tabulars (5 large and remainder medium size). All low and with cambered and uneven tops (no clean cut tabulars seen). 2 were old broken down tabulars and remainder irregular. 10 of these bergs were clustered together about 6 miles south of latter position and appeared as if they might be grounded.	Do.

SOUTHERN ICE REPORTS (*continued*).

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1936	12	From 64° 49′ S. To 64° 44′ S. To 64° 43′ S.	103° 18′ E. 103° 00′ E. 102° 28′ E.	8 bergs, pack ice	Skirting edge of close pack to N.W. and west to latter position where pack edge re-curved to the south for about 4 miles and then trended west again. 5 of these bergs were tabulars of large or medium size.	R.R.S. *William Scoresby*
		From 64° 43′ S. To 64° 44′ S.	102° 28′ E. 101° 31′ E.	35 bergs, pack ice	(25 of these bergs were large or medium size tabulars and clustered so close together that vessel was at times passing through channels with view obscured by these bergs on each side. Some were clean cut, uniform tabulars, while others had cambered and hummocked tops, and some much caverned. Several were marked with rusty brown stains. 1 broken down tabular measured 310 ft. high by sextant angles.) Extensive close pack to south throughout its northern edge, trending about W. by N. from a position 4′ south of former position to latter position where edge of pack was met. From latter position vessel entered pack and proceeded about 1½ miles S.S.W. towards Bowman Island which was visible about 30 miles off. As vessel pushed south, pack became rapidly more close and heavy with larger floes, and extended as far as visible to south with no openings, except small pools in lee of bergs.	Do.
		From 64° 44′ S. To 64° 41′ S.	101° 31′ E. 101° 00′ E.	3 bergs, pack ice	From former position where vessel cleared edge of pack again, the edge of pack trended W. by N. for about 3 miles and then N.W'ly. 2 of these bergs were tabular, 1 medium size, low and cambered, and 1 small high and listed. Also 1 small irregular berg, all to north of pack.	Do.
	13	From 64° 41′ S. To 64° 11′ S.	101° 00′ E. 99° 47′ E.	9 bergs, pack ice and sludge	2 large tabular and 7 small irregular bergs. Proceeding N.W. with edge of pack about 3–4′ to S.W. throughout. Sea freezing in places with large areas of slush or sludge.	Do.
		From 64° 11′ S. To 63° 50′ S.	99° 47′ E. 99° 01′ E.	Approximately 10 bergs, drift ice and pack	5 tabulars, 1 long and low with cambered and hummocked top, 1 medium size and 1 small and 2 old and broken down. Extensive pack to southward throughout. Edge of pack trending W.N.W. Very loose near edge with small pieces of heavy floes much honeycombed and rotten with much brash. Areas of loose drift ice to north of pack. All bergs except one in pack.	Do.
	14	From 63° 50′ S. To 63° 52′ S. To 63° 48′ S.	99° 01′ E. 98° 44′ E. 98° 32′ E.	21 bergs, pack ice	Met edge of pack again in 2nd position. Edge of pack clearly defined owing to northerly wind, and trending N.W. to latter position and E.S.E. in other direction. Pack extending as far as visible to S.E. and S. (visibility excellent). Pack close but very much broken up near edge consisting of small floes of varying thickness, some heavy, with much brash and many floe bergs. All bergs were in pack except 1 small irregular and comprised 11 tabulars, 6 of medium size, 3 small and 2 old and broken down. Remaining bergs small and irregular.	Do.
		From 63° 48′ S. To 63° 48′ S.	98° 32′ E. 97° 25′ E.	12 bergs, growlers, pack ice	Edge of pack extended about 8 miles N.W. from former position and then re-curved to S.W. for 5 miles. 6 bergs were sighted in this portion of the pack, all irregular, and 3 to seaward, 2 tabulars and 1 irregular. In latter position edge of pack trended W.N.W. and E.S.E. 3 more bergs and several growlers passed to seaward of pack.	Do.
	15	From 63° 48′ S. To 63° 37′ S. To 63° 43′ S. To 63° 32′ S.	97° 25′ E. 96° 05′ E. 95° 54′ E. 95° 25′ E.	27 bergs, drift ice and pack	13 of these bergs were tabular, 5 large (2 with hummocky snow tops) and 8 of medium size. Remainder were small and irregular or sea worn. Visibility was very poor throughout and all bergs were within 1 mile of track. Vessel was coasting along northern edge of pack through positions given, but edge of pack now very ragged and much loose drift and streams brash were encountered, extending to north of pack under influence of southerly gale, also many growlers.	Do.
		From 63° 32′ S. To 63° 26′ S.	95° 25′ E. 94° 30′ E.	7 bergs, pack ice and drift	4 medium size tabulars and 3 small irregular bergs. Detached areas and streams of pack ice and loose drift were encountered throughout. In latter position only small detached areas.	Do.
	16	From 63° 26′ S. To 62° 34′ S.	94° 30′ E. 94° 10′ E.	Approximately 46 bergs, several bergy bits and growlers.	20 of these were tabulars, 14 being of medium size, 2 very low and cambered, 1 small and 3 old and broken down or listed. Remainder small and irregular, some pinnacled and some very low and sea worn. At 1230 in position 63° 01′ S., 94° 05′ E., a small pinnacle berg was observed breaking down. There was a gentle breeze, slight sea and low swell at the time, the air temperature being 29° F. and sea surface 33° F. The pinnacles commenced to disintegrate from the top and then the sides commenced to slip away until whole berg was hidden in a cloud of snow and seemed to collapse with a roar. A wave 15 ft. high was caused, and when snow cleared berg appeared about half its original size (still pinnacled) and was surrounded by a compact area of growlers and brash. Sun was shining at the time.	Do.
		From 62° 34′ S. To 62° 47′ S.	94° 10′ E. 94° 12′ E.	Berg, 5 growlers	... ...	Do.
	17	From 62° 47′ S. To 63° 48′ S.	94° 12′ E. 92° 52′ E.	43 bergs, bergy bits, growlers and drift ice	18 tabular bergs, 2 large and 13 of medium size (5 of these including 1 large one near latter position), 3 small tabulars and remainder small and irregular. Several having only narrow pinnacles rising above surface and some very low and sea worn. A few bergy bits and growlers and, near latter position, a small area of widely scattered drift comprising rotten remains of heavy floes.	Do.
		From 63° 48′ S. To 63° 51′ S.	92° 52′ E. 92° 06′ E.	27 bergs, several bergy bits, many growlers and drift ice.	10 tabulars, all of medium size. Remaining bergs small and irregular. In latter position on northern edge of extensive area of loose drift with appearance of close pack to southward. 1 bergy bit with dark markings.	Do.
	18	From 63° 51′ S. To 63° 19′ S.	92° 06′ E. 90° 28′ E.	24 bergs, several growlers	15 tabulars, 4 of medium size and others small and broken down. Remaining bergs small and irregular or pinnacled.	Do.
		From 63° 19′ S. To 62° 59′ S.	90° 28′ E. 90° 21′ E.	5 bergs, several bergy bits	1 medium size tabular berg and 4 small and irregular ...	Do.
	19	From 62° 59′ S. To 64° 21′ S.	90° 21′ E. 89° 47′ E.	Approximately 20 bergs, several bergy bits and growlers.	7 medium size tabulars, 3 small and 1 broken down and listed tabulars. Remainder small and irregular or sea worn.	Do.
	20	From 64° 21′ S. To 63° 14′ S.	89° 47′ E. 87° 32′ E.	10 bergs, 5 bergy bits and a few growlers	3 tabulars, 1 of medium size and 2 broken down and listed. Remaining bergs small and irregular.	Do.
	21	From 63° 14′ S. To 63° 14′ S.	87° 32′ E. 86° 21′ E.	9 bergs, a few growlers	4 small tabular bergs, 2 being very low with uneven and much hummocked snow tops. Other bergs small and irregular. Within about 3 miles of track.	Do.
		From 63° 14′ S. To 63° 15′ S.	86° 21′ E. 83° 01′ E.	23 bergs, numerous bergy bits, several growlers.	9 tabulars, 5 medium size and 4 small. Other bergs medium or small irregulars.	Do.
	22	From 63° 15′ S. To 63° 39′ S.	83° 01′ E. 82° 00′ E.	11 bergs, 69 bergy bits	9 tabular bergs, 6 of medium size and 3 small, 2 irregular bergs and 69 very small bergs and bergy bits.	Do.
		From 63° 39′ S. To 64° 38′ S.	82° 00′ E. 79° 44′ E.	26 bergs, many bergy bits and growlers ...	12 tabular bergs, 2 large, 4 of medium size and remainder small or broken down (1 with dark markings). Other bergs irregular of medium or small size.	Do.
		From 64° 38′ S. To 64° 38′ S.	79° 44′ E. 79° 10′ E.	Bergs and drift ice	4 miles S.W. of former position encountered area of heavy drift ice extending N.W. and S.E. Proceeded N.W. by W. to latter position skirting areas of drift ice. Several small irregular bergs and bergy bits sighted.	Do.
	23	From 64° 38′ S. To 65° 20′ S.	79° 10′ E. 76° 20′ E.	24 bergs, 1 bergy bit	7 small or broken down tabulars, others small and irregular	Do.

SOUTHERN ICE REPORTS (*continued*).

Year.	Day.	Position.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1936	23	From 65° 20′ S. To 66° 22′ S.	76° 20′ E. 73° 49′ E.	22 bergs, a few bergy bits and growlers ...	1 large tabular berg, ¾ mile long by 160 ft. high (sextant angles), near latter position, 8 small and broken down tabulars. Remainder small and irregular.	R.R.S. *William Scoresby.*
	24	From 66° 22′ S. To 67° 37′ S.	73° 49′ E. 71° 20′ E.	Approximately 25 bergs, several bergy bits and growlers.	3 tabular bergs, 2 of medium size and 1 small. Other bergs small and irregular. 1 bergy bit partly bottle green.	Do.
		From 67° 37′ S. To 68° 05′ S.	71° 20′ E. 70° 44′ E.	Approximately 50 bergs, bergy bits and growlers.	About 20 of these bergs were in a line running N. and S., approximately 10 miles W.N.W. of former position. Several of these were large tabulars, the largest being estimated to be 3 miles in length, and they appeared to be grounded. Majority of other bergs irregular. 1 medium size and 1 small tabular bergs, 2 small irregulars.	Do.
		From 68° 05′ S. To 68° 43′ S.	70° 44′ E. 70° 44′ E.	4 bergs, several growlers	... ...	Do.
	25	From 68° 43′ S. To 68° 41′ S.	70° 44′ E. 71° 25′ E.	Many large growlers	... ...	Do.
		From 68° 41′ S. To 68° 35′ S. To 68° 29′ S. To 68° 26′ S. To 68° 26′ S. To 68° 30′ S. To 68° 30′ S. To 68° 33′ S.	71° 25′ E. 71° 42′ E. 72° 22′ E. 72° 30′ E. 72° 41′ E. 72° 57′ E. 73° 10′ E. 73° 16′ E.	Ice barrier, bergs and growlers	In first position encountered ice barrier to eastward, trending S.W. and N.E. Barrier was followed to the eastward through following positions, edge of barrier being from 1 to 3 miles to south of track throughout and varying from 90 to 160 ft. in height. In last position barrier edge was 1 mile to westward and trended to S.S.E. as far as visible, with open water to south and east. 12 tabular bergs (small and medium) and 8 irregular bergs passed. Also a large number of floe bergs, bergy bits and growlers and some streams brash. Several bergy bits partly bottle green. Some bergs and growlers with veins of dark ice.	Do.
	25	From 68° 33′ S. To 67° 48′ S.	73° 16′ E. 70° 25′ E.	Approximately 35 bergs, numerous bergy bits and growlers.	Majority of bergs tabulars of small or medium size, 2 being large. Many bergy bits and growlers with small areas of brash.	Do.
	26	From 67° 48′ S. To 67° 49′ S. To 67° 44′ S.	70° 25′ E. 70° 06′ E. 69° 57′ E.	Large number bergs	Between two latter positions navigating amongst innumerable bergs, mostly tabular and many of large size, probably grounded.	Do.
		From 67° 44′ S. To 67° 30′ S. To 67° 30′ S. To 67° 38′ S.	69° 57′ E. 70° 03′ E. 69° 43′ E. 69° 25′ E.	Large number bergs, drift ice	Near former position encountered impenetrable barrier of grounded bergs extending from position 5 miles east of C. Darnley, about 14 miles 030° and about 5 miles in width. In Latitude 67° 30′ S. it was possible to find a passage to the westward between bergs, although line of grounded bergs extended many miles further to the N.E. After proceeding about 7 miles west, it was possible to make to south westward again to latter position where area of close set bergs was cleared. In southern part of this area the majority of bergs were tabulars of medium size. Areas of loose drift ice and small areas old open pack ice also encountered near latter position.	Do.
		From 67° 38′ S. To 67° 44′ S. To 67° 44′ S. To 67° 44′ S.	69° 25′ E. 69° 10′ E. 68° 43′ E. 67° 55′ E.	18 bergs, numerous bergy bits and growlers, pancake ice and slush.	Coast of MacRobertson Land 5 to 6 miles to southward throughout, entirely ice covered with low ice cliff. Between 2nd and 3rd position sea surface was entirely covered with pancake ice and slush, extending from the coast to about 3 miles north of vessels track. In other places streams of slush were forming in spite of an off shore wind of gale force and rough sea. (Air temperature 18° F., sea surface 29° F.) 2 tabular bergs, 1 medium size and 1 small. Remainder small and irregular. All within 5 miles of track.	Do.
		From 67° 44′ S. To 67° 45′ S.	67° 55′ E. 66° 56′ E.	Approximately 10 bergs, several bergy bits and growlers.	2 tabulars. Others small and irregular	Do.
		From 67° 45′ S. To 67° 34′ S.	66° 56′ E. 66° 05′ E.	18 bergs, many bergy bits and growlers ...	1 small tabular berg, others small and irregular. All to seaward.	Do.
		From 67° 34′ S. To 67° 03′ S.	66° 05′ E. 65° 09′ E.	8 bergs, bergy bits, drift ice and pack ...	All small irregular bergs. Numerous bergy bits. 1 large floe berg, much hummocked, with dark ice underneath. About 10 miles N.W. of former position encountered streams of pack ice running to N.E. and S.W. Large area of pack ice to S.W., heavy in places. Much scattered drift ice in this region with bergy bits and growlers very numerous.	Do.
	27	From 67° 03′ S. To 66° 42′ S.	65° 09′ E. 63° 49′ E.	2 bergs	Small tabulars	Do.
		From 66° 42′ S. To 66° 46′ S.	63° 49′ E. 62° 00′ E.	Approximately 50 bergs. Also three areas grounded bergs as below.	Passed about 50 bergs of all types in addition to three areas grounded bergs as given below. Also many growlers.	Do.
		66° 51′ S.	63° 22′ E.	Grounded bergs	Mean position of group 30 to 40 close set bergs. Apparently grounded.	Do.
		66° 48′ S.	63° 10′ E.	Grounded bergs	Mean position of group 30 to 40 close set bergs. Apparently grounded.	Do.
		66° 44′ S.	62° 10′ E.	Grounded bergs	Line of bergs (apparently grounded) stretching 5 miles S.S.E. from this position.	Do.
		From 66° 46′ S. To 66° 50′ S.	62° 00′ E. 61° 09′ E.	Approximately 28 bergs, numerous bergy bits and growlers.	Of these bergs 14 were in a line running N. and S. through latter position, 5 being small tabulars and remainder small and irregular. 1 small tabular (slightly listed) measured by sextant and rangefinder was 186 ft. high. Close to this berg a sounding of 120 fathoms was obtained. It seems probable that some of these bergs were grounded.	Do.
		From 66° 50′ S. To 66° 54′ S.	61° 09′ E. 60° 30′ E.	Approximately 50 bergs, numerous bergy bits and growlers.	8 of these were small tabulars and 5 broken down or listed tabulars. Remainder small and irregular or sea worn. A few with dark markings. Fairly evenly distributed between two positions and within about 8 miles of track. In latter position sounding gave 75 fathoms.	Do.
		From 66° 54′ S. To 67° 13′ S.	60° 30′ E. 59° 55′ E.	Approximately 13 bergs, some bergy bits and growlers.	5 tabulars (small or medium size). Remainder small and irregular.	Do.
		From 67° 13′ S. To 67° 20′ S. To 67° 21′ S.	59° 55′ E. 59° 49′ E. 59° 40′ E.	A few bergy bits and growlers	... ...	Do.
	28	From 67° 21′ S. To 66° 59′ S.	59° 40′ E. 58° 37′ E.	Approximately 12 bergs, bergy bits, growlers and pack ice.	6 of these bergs were very low and uneven, but fairly flat pieces of coastal barriers, 2 being approximately ¾ mile in length, remainder of medium size. Numerous bergy bits and growlers, some partly bottle green, 2 small detached areas of pack consisting of fairly heavy floes. Within 5 miles track.	Do.
		From 66° 59′ S. To 66° 50′ S.	58° 37′ E. 57° 35′ E.	4 bergs, pack ice	Large glacier bergs. In latter position sighted pack ice about 3 miles to westward extending to northward along coast of Kemp Land.	Do.
		From 66° 50′ S. To 66° 46′ S. To 66° 35′ S. To 66° 24′ S. To 66° 06′ S.	57° 35′ E. 57° 35′ E. 58° 08′ E. 58° 16′ E. 57° 46′ E.	Numerous bergs, pack ice and new ice ...	In 2nd position encountered light open pack comprising floes of new ice, with large areas pancake ice and slush. Coasted along eastern edge of pack through following positions. Pack extending to coast of Kemp Land to westward. To eastward of C. Davis passed large number of tabular bergs of large or medium size. Approximately 40 being passed near track, of an average length of about ½ mile. Many other bergs of various types sighted. About 12 tabular bergs (5 medium size and 7 small) were clustered in small area 2 miles to westward of latter position.	Do.
		From 66° 06′ S. To 65° 49′ S.	57° 46′ E. 57° 27′ E.	Drift ice	Passed streams pack ice and areas of scattered drift ...	Do.
	29	From 65° 20′ S. To 64° 56′ S.	56° 47′ E. 57° 05′ E.	9 bergs, a few growlers	3 small tabulars (1 old high and worn). Others small and irregular.	Do.
		From 64° 56′ S. To 64° 34′ S. To 64° 32′ S.	57° 05′ E. 56° 53′ E. 56° 22′ E.	2 bergs	Small and irregular	Do.
	19	55° 08½′ S.	119° 18′ W.	Berg	1,000 ft. long, 300 ft. high	S.S. *Port Denison.*

SOUTHERN ICE REPORTS (*continued*).

March.

Year.	Day.	Position of Ice.		Description.	Remarks.	Name of Ship reporting.
		Latitude.	Longitude.			
1936	2	From 64° 03′ S. To 63° 48′ S.	55° 00′ E. 53° 45′ E.	2 bergs	1 small and pinnacled and 1 very small irregular	R.R.S. *William Scoresby*.
		63° 31′ S.	52° 38′ E.	Berg	Small and irregular	Do.
	4	From 64° 08′ S. To 64° 12′ S.	51° 56′ E. 52° 00′ E.	2 bergs	Small and irregular	Do.
	5	From 64° 25′ S. To 64° 32′ S. To 65° 19′ S.	53° 18′ E. 53° 36′ E. 51° 27′ E.	2 bergs, 2 bergy bits	1 small and 1 medium size tabular. Bergy bits of clear green ice.	Do.
		From 65° 19′ S. To 65° 48′ S.	51° 27′ E. 51° 11′ E.	2 bergs	Small and irregular	Do.
		From 65° 48′ S. To 66° 01′ S.	51° 11′ E. 51° 16′ E.	Approximately 50 bergs, a number of growlers and areas of brash.	Nearly all tabular bergs of medium size. About 35 were within 7 miles radius of latter position. Some of these were probably grounded. In addition, the coastline to the south in the region of C. Anne was almost entirely blocked with bergs (mostly tabular) and pack ice.	Do.
	6	From 66° 01′ S. To 66° 15′ S.	51° 16′ E. 50° 23′ E.	Large number of bergs, pack and drift ice	About 100 bergs passed within 7 or 8 miles of track. Of these about 75 were tabulars, 6 being large and about 50 of medium size. Others small. 1 was estimated to be 2 miles in length. Numbers of these bergs were clustered together and probably grounded. In addition the coast to the S.E. in the region of C. Anne was almost entirely blocked with bergs. Between these two positions large areas and streams of pack were encountered, but all very light and apparently fairly new ice. Whole area covered with scattered pieces drift, numerous growlers and bergy bits.	Do.
		From 66° 15′ S. To 66° 25′ S.	50° 23′ E. 50° 13′ E.	10 bergs, several bergy bits and growlers, drift ice.	All tabulars of large or medium size. In latter position coastline was about 2½ miles to eastward, trending S.S.W. and comprising low ice cliff with featureless snow slopes in background. Coast free of pack in this part. Streams of loose drift only met.	Do.
		From 66° 25′ S. To 65° 59′ S.	50° 13′ E. 49° 17′ E.	2 bergs, a few growlers	1 broken down tabular and 1 small irregular…	Do.
	7	From 65° 59′ S. To 65° 32′ S.	49° 17′ E. 47° 26′ E.	4 bergs, a few growlers	1 medium size high tabular and 3 small irregulars	Do.
	8	From 64° 52′ S. To 64° 24′ S.	46° 32′ E. 45° 49′ E.	2 bergs	Small and irregular	Do.
		From 64° 24′ S. To 64° 16′ S. To 64° 16′ S. To 64° 20′ S.	45° 49′ E. 45° 29′ E. 45° 07′ E. 45° 29′ E.	3 bergs, 1 bergy bit	All irregulars, 1 large and 2 small	Do.
	9	From 64° 20′ S. To 64° 07′ S. To 63° 52′ S. To 64° 03′ S.	45° 29′ E. 45° 24′ E. 45° 00′ E. 44° 24′ E.	4 bergs, 1 growler	All small and irregular	Do.
	10	From 64° 29′ S. To 65° 07′ S.	44° 15′ E. 42° 52′ E.	2 growlers		Do.
	11	From 65° 07′ S. To 66° 14′ S. To 66° 34′ S.	42° 52′ E. 39° 34′ E. 38° 32′ E.	6 bergs, 4 growlers	All small and irregular	Do.
	12	From 66° 34′ S. To 66° 52′ S.	38° 32′ E. 37° 45′ E.	2 bergs	Small and irregular	Do.
		From 66° 52′ S. To 65° 56′ S.	37° 45′ E. 35° 14′ E.	Berg	Small and irregular	Do.
	13	From 65° 56′ S. To 65° 59′ S. To 66° 25′ S.	35° 14′ E. 33° 37′ E. 33° 31′ E.	Berg	Small	Do.
		From 66° 25′ S. To 66° 24′ S.	33° 31′ E. 30° 25 E.	1 bergy bit, 1 growler…		Do.
	14	From 66° 54′ S. To 66° 12′ S.	30° 27′ E. 31° 11′ E.	Berg	Small and irregular	Do.
	15	From 66° 12′ S. To 65° 10′ S.	31° 11′ E. 32° 01′ E.	2 bergs, a few growlers	Bergs small and irregular. Occasional very small pieces observed.	Do.
	16	From 65° 10′ S. To 65° 00′ S.	32° 01′ E. 32° 12′ E.	2 bergs	Small and irregular	Do.
	17	From 64° 52′ S. To 64° 38′ S.	31° 51′ E. 30° 57′ E.	2 bergs, 2 bergy bits	1 broken down tabular and 1 small irregular	Do.
		From 64° 38′ S. To 63° 59′ S.	30° 57′ E. 29° 34′ E.	3 bergs, several growlers	All very small and irregular bergs	Do.
	18	From 63° 59′ S. To 63° 57′ S.	29° 34′ E. 27° 21′ E.	3 bergs, 4 bergy bits and 2 growlers	1 old broken down and listed tabular, 2 small irregulars	Do.
		From 63° 57′ S. To 63° 56′ S.	27° 21′ E. 26° 04′ E.	4 bergs, several growlers	Bergs small and irregular. Within 2 miles of track	Do.
	19	From 63° 56′ S. To 63° 55′ S. To 64° 21′ S.	26° 04′ E. 24° 10′ E. 22° 56′ E.	10 bergs, 4 bergy bits and a number of growlers.	All bergs small and irregular	Do.
		From 64° 21′ S. To 64° 23′ S. To 64° 27′ S.	22° 56′ E. 23° 24′ E. 23° 03′ E.	Approximately 7 bergs	All small and irregular	Do.
	 20	From 64° 27′ S. To 64° 14′ S.	23° 03′ E. 23° 50′ E.	2 bergs, several bergy bits and growlers	Bergs very small, low and sea worn	Do.
		From 64° 14′ S. To 64° 25′ S. To 64° 11′ S.	23° 50′ E. 23° 53′ E. 25° 00′ E.	7 bergs, several bergy bits and growlers	2 or 3 very small worn tabular bergs. Others small and irregular.	Do.
	21	From 64° 11′ S. To 63° 53′ S.	25° 00′ E. 25° 59′ E.	7 bergs, 4 bergy bits and a few growlers	1 old and broken down tabular berg. Others small and irregular.	Do.
		From 63° 53′ S. To 63° 30′ S.	25° 59′ E. 26° 24′ E.	12 bergs, several bergy bits and growlers	1 small broken down tabular. Other bergs very small and irregular.	Do.
	22	From 63° 30′ S. To 62° 50′ S.	26° 24′ E. 25° 13′ E.	10 bergs, 5 bergy bits and several growlers	All bergs small and irregular	Do.
		From 62° 50′ S. To 62° 15′ S.	25° 13′ E. 25° 19′ E.	5 bergs and 2 bergy bits	Bergs all very small and irregular	Do.
	23	From 62° 15′ S. To 62° 02′ S.	25° 19′ E. 25° 24′ E.	4 bergs, 1 bergy bit	1 broken down tabular berg. Others very small and irregular.	Do.
		From 62° 02′ S. To 61° 33′ S.	25° 24′ E. 24° 57′ E.	5 bergs, 2 bergy bits and 4 growlers	1 small old and listed tabular berg. Remainder very small and irregular.	Do.
	24	From 61° 33′ S. To 61° 43′ S. To 61° 26′ S.	24° 57′ E. 25° 11′ E. 24° 28′ E.	5 bergs	All small and irregular	Do.
	25	From 61° 26′ S. To 60° 03′ S.	24° 28′ E. 23° 39′ E.	Berg	Small. Within 2 miles of track	Do.
		From 60° 03′ S. To 58° 40′ S.	23° 39′ E. 23° 00′ E.	9 bergs, a few small growlers	All small irregular bergs. Within 5 miles of track	Do.
	26	From 58° 40′ S. To 58° 15′ S.	23° 00′ E. 22° 26′ E.	2 bergs	Small and irregular	Do.
		From 58° 15′ S. To 57° 51′ S.	22° 26′ E. 22° 13′ E.	2 bergs	Small and irregular	Do.
	27	From 56° 49′ S. To 55° 58′ S.	21° 31′ E. 21° 14′ E.	4 bergs, 1 growler	1 high old tabular and 3 very small irregular bergs	Do.
		From 55° 58′ S. To 55° 16′ S.	21° 14′ E. 21° 00′ E.	1 bergy bit, 1 growler…	Bergy bit 5–6 miles west of latter position and last ice sighted on passage north to the Cape.	Do.
	14	62° 19′ S.	145° 43′ E.	Tabular berg	Medium size, 2 miles to east of course. This is the first ice seen since leaving coast of Tasmania on a course 180°.	R.R.S. *Discovery II*.
	15	65° 00′ S.	145° 48′ E.	2 large tabular bergs, 4 miles south of vessel	Pack ice was encountered at this position—the main pack extended to south, east and west, some 4 miles distant. Vessel turned westward in the loose ice which fringed the main pack.	Do.

SOUTHERN ICE REPORTS (*continued*).

Year.	Day.	Position of Ice.			Description.	Remarks.	Name of Ship reporting.
			Latitude.	Longitude			
1936	16		65° 00′ S.	143° 26′ E.	4 tabular bergs, medium size … …	4 miles to south. Many growlers and bergy bits in vicinity.	R.R.S. *Discovery II*.
						The following positions when joined up will give the position of the pack ice edge as found by this vessel on 15th and 16th March, 1936.	Do.
	15		65° 00′ S.	145° 48′ E.			
		To	65° 00′ S.	145° 44′ E.			
		To	64° 57′ S.	145° 11′ E.			
		To	64° 59′ S.	145° 00′ E.			
	16	To	64° 58′ S.	144° 28′ E.			
		To	64° 45′ S.	144° 25′ E.			
		To	64° 45′ S.	144° 07′ E.		During this period vessel passed through large areas of pancake ice and newly formed ice. On occasions the sea at edge of the pack appeared to be freezing over.	Do.
		To	64° 54′ S.	143° 41′ E.			
		To	65° 12′ S.	143° 40′ E.			
		To	65° 09′ S.	143° 21′ E.			
		To	65° 07′ S.	142° 51′ E.			
		To	65° 03′ S.	143° 05′ E.			
		To	65° 00′ S.	142° 33′ E.			
		To	65° 07′ S.	141° 55′ E.			
		To	64° 54′ S.	141° 34′ E.			
	16		65° 00′ S.	142° 33′ E.	6 tabular bergs … … … …	Medium size, average height, within 3 miles. Also many bergy bits.	Do.
			65° 03′ S.	142° 12′ E.	2 large tabular bergs … … … …	These two bergs appeared close together and had an approximate combined length of 7 miles. Lost in mist before extremities could be clearly distinguished.	Do.
			64° 57′ S.	142° 00′ E.	2 large tabular bergs … … … …	… … … … … … … … …	Do.
	20		65° 06′ S.	127° 02′ E.		Vessel again encountered heavy pack ice and many bergs …	Do.
	21		65° 05′ S.	126° 36′ E.		Vessel proceeded from this position along the edge of pack ice—navigating for the most part in pancake ice and slush.	Do.
	22		65° 00′ S.	126° 21′ E.			
		To	64° 53′ S.	125° 57′ E.			
		To	64° 53′ S.	125° 17′ E.		Edge of pack ice. Numerous bergs and growlers in sight. Mostly medium size, irregular.	Do.
		To	65° 11′ S.	123° 58′ E.			
		To	65° 03′ S.	121° 31′ E.			
		To	65° 24′ S.	120° 42′ E.			
	23		64° 31′ S.	117° 00′ E.	3 bergs … … … … … …	Irregular, medium size, 1 mile distant … … …	Do.
			63° 44′ S.	115° 11′ E.	1 berg … … … … … …	Irregular, medium size, ½ mile distant … … …	Do.
			63° 16′ S.	113° 58′ E.	1 small tabular berg … … … …	… … … … … … … … …	Do.
					1 small irregular berg … … …	… … … … … … … … …	Do.
	25		63° 54′ S.	107° 45′ E.	1 tabular berg … … … … …	Medium size, 1 mile distant … … … … …	Do.
			64° 02′ S.	107° 26′ E.	1 tabular berg … … … … …	Medium size, 2 miles distant … … … … …	Do.
			64° 23′ S.	106° 33′ E.	2 small irregular bergs … … …	… … … … … … … … …	Do.
			64° 30′ S.	106° 13′ E.		Navigating in pancake ice … … … … …	Do.
		From	64° 21′ S.	105° 56′ E.			
		To	64° 17′ S.	104° 15′ E.	Ice edge … … … … …	Clear of pancake ice. Skirting ice to westward … …	Do.
		To	63° 56′ S.	100° 17′ E.		Many bergs fast in pack to the south … … … …	Do.
	26		63° 57′ S.	100° 18′ E.	… … … … … … …	1 large tabular berg estimated 1½ miles long. Average height, 150 ft.–200 ft.	Do.
	27		62° 50′ S.	100° 51′ E.	… … … … … … …	3 small irregular bergs. Distance, 2 miles … … …	Do.
			61° 07′ S.	101° 49′ E.	… … … … … … …	Many growlers … … … … … … …	Do.
	28		61° 13′ S.	102° 04′ E.	5 bergs … … … … … …	Medium size, irregular … … … … … …	Do.
			60° 20′ S.	102° 39′ E.	6 bergs … … … … … …	Irregular … … … … … … … …	Do.
	29		57° 20′ S.	104° 40′ E.	1 small berg … … … … …	The last ice seen on a course 015° to C. Naturalist, W. Australia.	Do.

Reports of ice sighted in the Month of March in years previous to 1936 which have not previously been published in "Marine Observer."

1935	29	49° 45′ S.	93° 53′ E.	Berg and growler … … … …	Berg 100 ft. high, 400 ft. long (sextant angles) … …	S.S. *Tasmania*.
	30	48° 55′ S.	98° 28′ E.	Berg … … … … … …	… … … … … … … … … …	Do.
		48° 52′ S.	98° 28′ E.	Berg … … … … … …	… … … … … … … … … …	Do.
		48° 52′ S.	98° 33′ E.	Berg … … … … … …	… … … … … … … … … …	Do.
		48° 58′ S.	98° 55′ E.	2 bergs and 6 growlers … … …	… … … … … … … … … …	Do.

Reports of ice previous to January, February and March, 1936, will be found in the "Marine Observer," Vol. XIII, No. 121, page 23.

MARINE METEOROLOGY AND SAFE NAVIGATION.

Extracts from Merchant Shipping (Safety and Load Line Conventions) Act, 1932. First Schedule.

International Convention for the Safety of Life at Sea, 1929.

Article 33.

Application.

The provisions of this Chapter referring to ships, unless otherwise expressly provided, apply to all ships on all voyages.

Article 34.

Danger Messages.

The master of every ship which meets with dangerous ice, a dangerous derelict, a dangerous tropical storm or any other direct danger to navigation is bound to communicate the information by all the means of communication at his disposal, to the ships in the vicinity, and also to the competent authorities at the first point of the coast with which he can communicate. It is desirable that the said information be sent in the manner set out in Regulation XLVI.*

Each Administration will take all steps which it thinks necessary to ensure that when intelligence of any of the dangers specified in the previous paragraph is received, it will be promptly brought to the knowledge of those concerned and communicated to other Administrations interested.

The transmission of messages respecting the dangers specified is free of cost to the ships concerned.

Article 35.

Meteorological Services.

The Contracting Governments undertake to encourage the collection of meteorological data by ships at sea, and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation.

In particular, the Contracting Governments undertake to cooperate in carrying out, as far as practicable, the following meteorological arrangements :—

(*a*) To warn ships of gales, storms and tropical storms, both by the issue of wireless messages and by the display of appropriate signals at coastal points :

(*b*) To issue daily, by radio, weather bulletins suitable for shipping, containing data of existing weather conditions and forecasts :

(*c*) To arrange for certain selected ships to take meteorological observations at specified hours, and to transmit such observations by wireless telegraphy for the benefit of other ships and of the various official meteorological services; and to provide coast stations for the reception of the messages transmitted :

(*d*) To encourage all ship-masters to inform surrounding ships whenever they experience wind force of 10 or above on the Beaufort scale (force 8 or above on the decimal scale).

The information provided for in paragraphs (*a*) and (*b*) of this Article will be furnished in form for transmission in accordance with Article 31, sections, 1, 3 and 5, and Article 19, section 25, of the General Regulations annexed to the International Radiotelegraph Convention, Washington, 1927, and during transmission "to all stations" of meteorological information, forecasts and warnings, all ship stations must conform to the provisions of Article 31, section 2, of those General Regulations.

Weather observations from ships addressed to national meteorological services will be transmitted with the priority specified in Article 3, Additional Regulations, International Radiotelegraph Convention, Washington, 1927.

Forecasts, warnings, synoptic and other meteorological reports intended for ships shall be issued and disseminated by the national service in the best position to serve various zones and areas, in accordance with mutual arrangements made by the countries concerned.

Every endeavour will be made to obtain a uniform procedure in regard to the international meteorological services specified in this Article, and, as far as is practicable, to conform to the recommendations made by the International Meteorological Organization, to which organization the Contracting Governments may refer for study and advice any meteorological questions which may arise in carrying out the present Convention.

Article 36.

Ice Patrol. Derelicts.

The Contracting Governments undertake to continue a service of ice patrol and a service for study and observation of ice conditions in the North Atlantic. Further, they undertake to take all practicable steps to ensure the destruction or removal of derelicts in the northern part of the Atlantic Ocean east of the line drawn from Cape Sable to a point in latitude 34° N., longitude 70° W., if this destruction or removal is considered necessary at the time.

The Contracting Governments undertake to provide not more than three vessels for these three services. During the whole of the ice season they shall be employed in guarding the south-eastern, southern and south-western limits of the regions of icebergs in the vicinity of the Great Bank of Newfoundland for the purpose of informing trans-Atlantic and other passing vessels of the extent of this dangerous region; for the observation and study of ice conditions in general; for the destruction or removal of derelicts; and for the purpose of affording assistance to vessels and crews requiring aid within the limits of operation of the patrol vessels.

During the rest of the year the study and observation of ice conditions shall be maintained as advisable, and one vessel shall always be available for the search for, and destruction or removal of derelicts.

Article 37.

Ice Patrol. Management and Cost.

The Government of the United States is invited to continue the management of these services of ice patrol, study and observation of ice conditions, and derelict destruction and removal. The Contracting Governments specially interested in these services, whose names are given below, undertake to contribute to the expense of maintaining and operating these services in the following proportions :—

	Per cent.
Belgium	2
Canada	3
Denmark	2
France	6
Germany	10
Great Britain and Northern Ireland	40
Italy	6
Japan	1
Netherlands	5
Norway	3
Spain	1
Sweden	2
Union of Socialist Soviet Republics	1
United States of America	18

Each of the Contracting Governments has the right to discontinue its contribution to the expense of maintaining and operating these services after September 1st, 1932. Nevertheless, the Contracting Government which avails itself of this right will continue responsible for the expense of working up to September 1st following the date of giving notice of intention to discontinue its contribution. To take advantage of the said right it must give notice to the other Contracting Governments at least six months before the said September 1st, so that, to be free from this obligation on September 1st, 1932, it must give notice on March 1st, 1932, at the latest, and similarly for each subsequent year.

---

* See page 35.

If, at any time, the United States Government should not desire to continue these services, or if one of the Contracting Governments should express a wish to relinquish responsibility for the pecuniary contribution defined above, or to have its percentage of obligation altered, the Contracting Governments shall settle the question in accordance with their mutual interests.

The Contracting Governments which contribute to the cost of the three above-mentioned services shall have the right by common consent to make from time to time such alterations in the provisions of this Article and of Article 36 as appear desirable.

Article 38.

Speed Near Ice.

When ice is reported on, or near, his course, the master of every ship at night is bound to proceed at a moderate speed or to alter his course so as to go well clear of the danger zone.

Article 39.

North Atlantic Routes.

The practice of following recognised routes across the North Atlantic in both directions has contributed to safety of life at sea, but the working of these routes should be further investigated and studied with a view to the introduction of such variations as experience may show to be necessary.

The selection of the routes and the initiation of action with regard to them is left to the responsibility of the steamship companies concerned. The Contracting Governments will assist the companies, when requested to do so, by placing at their disposal any information bearing on the routes which may be in the possession of the Governments.

The Contracting Governments undertake to impose on the companies the obligation to give public notice of the regular routes which they propose their vessels should follow, and of any changes made in these routes; they will also use their influence to induce the owners of all vessels crossing the Atlantic to follow, so far as circumstances will permit, the recognised routes, and to induce the owners of all vessels crossing the Atlantic bound to or from ports of the United States via the vicinity of the Great Bank of Newfoundland to avoid, as far as practicable, the fishing banks of Newfoundland north of Latitude 43° N. during the fishing season, and to pass outside regions known or believed to be endangered by ice.

The Administration managing the ice patrol service is requested to report to the Administration concerned any ship which is observed not to be on any regular, recognised or advertised route, or which crosses the above-mentioned fishing banks during the fishing season, or which, when proceeding to or from ports of the United States, passes through regions known or believed to be endangered by ice.

Regulation XLVI.

Transmission of Information.

The transmission of information regarding ice, derelicts, tropical storms or any other direct danger to navigation is obligatory. The form in which the information is sent is not obligatory. It may be transmitted either in plain language (preferably English) or by means of the International Code of Signals (Wireless Telegraphy Section). It should be issued **CQ** to all ships, and should also be sent to the first point of the coast to which communication can be made with a request that it be transmitted to the appropriate authority.

All messages issued under Article 34 of the present Convention will be preceded by the safety signal TTT followed by an indication of the nature of the danger, thus: TTT Ice; TTT Derelict; TTT Storm; TTT Navigation.

Information Required.

The following information is desired, the time in all cases being Greenwich Mean Time :—

(*a*) *Ice, Derelicts and other Direct Dangers to Navigation.*

(1) the kind of ice, derelict or danger observed;

(2) the position of the ice, derelict or danger when last observed;

(3) the time and date when the observation was made.

(*b*) *Tropical Storms.* (Hurricanes in the West Indies, Typhoons in the China Seas, Cyclones in Indian waters, and storms of a similar nature in other regions.)

(1) *A Statement that a Tropical Storm has been Encountered.*

This obligation should be interpreted in a broad spirit, and information transmitted whenever the master has good reason to believe that a tropical storm exists in his neighbourhood.

(2) *Meteorological Information.*

In view of the great assistance given by accurate meteorological data in fixing the position and movement of storm centres, each shipmaster should add to his warning message as much of the following meteorological information as he finds practicable :—

(*a*) barometric pressure (millibars, inches or millimetres);

(*b*) change in barometric pressure (the change during the previous two to four hours);

(*c*) wind direction (true not magnetic);

(*d*) wind force (Beaufort or decimal scale);

(*e*) state of the sea (smooth, moderate, rough, high);

(*f*) swell (slight, medium, heavy) and the direction from which it comes.

When barometric pressure is given the word "Millibars," "inches" or "millimetres," as the case may be, should be added to the reading, and *it should always be stated whether the reading is corrected or uncorrected.*

When changes of the barometer are reported the course and speed of the ship should also be given.

All directions should be true, not magnetic.

(3) *Time and Date and Position of the Ship.*

These should be for the time and position when the meteorological observations reported were made and not when the message was prepared or despatched. The time used in all cases should be Greenwich Mean Time.

(4) *Subsequent Observations.*

When a master has reported a tropical storm it is desirable but not obligatory, that other observations be made and transmitted at intervals of three hours, so long as the ship remains under the influence of the storm.

Examples.

Ice.

TTT Ice. Large berg sighted in 4605 N., 4410 W., at 0800 G.M.T. May 15.

Derelict.

TTT Derelict. Observed derelict almost submerged in 4006 N., 1243 W., at 1630 G.M.T. April 21.

Danger to Navigation.

TTT Navigation. Alpha lightship not on station. 1800 G.M.T. January 3.

Tropical Storm.

TTT Storm. Experiencing tropical storm. Barometer corrected 994 millibars, falling rapidly. Wind N.W., force 9, heavy squalls Swell E. Course E.N.E., 5 knots. 2204 N., 11354 E. 0030 G.M.T. August 18.

TTT Storm. Appearances indicate approach of hurricane. Barometer corrected 29·64 inches falling. Wind N.E., force 8. Swell medium from N.E. Frequent rain squalls. Course 35°, 9 knots. 2200 N., 7236 W. 1300 G.M.T. September 14.

TTT Storm. Conditions indicate intense cyclone has formed. Wind S. by W., force 5. Barometer uncorrected 753 millimetres, fell 5 millimetres last three hours. Course N. 60 W., 8 knots. 1620 N., 9302 E. 0200 G.M.T. May 4.

TTT Storm. Typhoon to south-east. Wind increasing from N. and barometer falling rapidly. Position 1812 N., 12605 E. 0300 G.M.T. June 12.

WIRELESS WEATHER SIGNALS.

Under the heading "Wireless Weather Signals" it is intended to publish particulars and concise descriptions of Signals and Code used for reporting Weather, Ice and Time, in conformity with the International Convention of Safety of Life at Sea, in four sections.

I. Ships' Wireless Weather Signals.

II. Wireless Weather Signals made from the shore to ships. (Weather Bulletins and Storm Warnings.)

III. Wireless Time Signals.

IV. Wireless Ice Signals.

Sections II, III and IV will be published as far as possible in geographical order, so that the most suitable of these signals for all parts of the world may be as complete as possible in each year's Numbers of THE MARINE OBSERVER.

The International Ships' Wireless Weather Telegraphy Code, which came into force on May 1st, 1930, is given on pp. 44 to 47.

Request for information to Meteorological Services of Maritime Countries.

Invitation is hereby given to send concise descriptions of Weather Signals made for the information of shipping and seamen in all parts of the World, in accord with the International Convention of Safety of Life at Sea, 1929, with a view to publication in the appropriate number of "The Marine Observer." Only limited space is available.

REQUEST TO WEATHER SERVICES OF ALL MARITIME COUNTRIES.

In conformity with the International Convention for Safety of Life at Sea, the State Weather Services of maritime countries in all parts of the world, desiring to receive routine weather reports from British shipping, are invited to forward the names of W.T. stations appointed to receive weather reports from Selected Ships in order that the British Meteorological Office may be enabled to encourage the service specified in Article 35, clause (c) of that Convention, and so fulfil Great Britain's part in this International Contract.

The organization of British Selected Ships has now been worked up to a high state of efficiency and, where necessary, other British ships are invited to complete the desired service as far as possible. It is therefore necessary that the lists of wireless stations detailed to receive or intercept reports from British Selected Ships should be kept up to date and be as complete as possible in "The Marine Observer" so that these lists may be copied in other publications available generally to British shipping. Foreign, British Dominion and Colonial Weather Services are therefore asked—if they desire weather reports from British ships—to forward the following information :—

(1) The name of the receiving station which is appointed to work in conformity with the schedule given on page 38 for Type A.1, C.W. ships, with its call sign, latitude and longitude, similar to that given on page 40 for Portishead, except that the control system is only necessary in areas of great congestion such as the Eastern North Atlantic and North Sea.

(2) The name of the station or stations detailed to intercept or receive reports from "B" Selected Ships, working the schedule given on page 38, for Type A.2, I.C.W., and Type B ships, with call sign, latitude and longitude, similar to that given on p. 42 for Jacobs (Durban).

(3) The telegraphic address of the appropriate meteorological centre should be given in each case, together with the desired groups of the International Ships' Wireless Weather Telegraphy Code, Copenhagen, 1929.

(4) It is desirable that the stations appointed to receive reports from British Selected Ships and other British ships where and when necessary should be well distributed, and as far as possible that one station only should be appointed to serve an area consistent with the wireless range of Selected Ships, which is up to about 1,800 miles for "A" Selected Ships, and upwards from 200 miles for "B" Selected Ships.

Attention is invited to Section (35) and the additional local observation times given therein.

I. SHIPS' WIRELESS WEATHER SIGNALS.

WORLD-WIDE SYSTEM OF VOLUNTARY SELECTED SHIPS ROUTINE WIRELESS WEATHER TELEGRAPHY.

(1) For the purpose of aiding navigation, in accordance with Article 35, para. (*c*) of the International Convention for Safety of Life at Sea, 1929, Merchant Shipping (Safety and Load Line Conventions) Act, 1932, First Schedule (see page 34), and to assist the meteorological services of the world with weather intelligence, it is intended that there shall be an agreed number of regularly reporting ships, termed Selected Ships, of all nations, distributed over all oceans, working voluntarily under their national state meteorological institutions.

At present the number agreed upon is 1,000 of all nations.

(2) In order that this work may be fairly distributed amongst the different national merchant navies, and to prevent congestion in wireless communication, it is intended that each national meteorological service should maintain in voluntary service a number of Ships on the register of their own country as Selected Ships, in accordance with their proportion of the world's tonnage of steam and motor vessels of over 100 tons.

The following table gives the world's tonnage and the number of Selected Ships at present desired for each maritime country of the world, including those that are not yet party to the Convention of Safety of Life at Sea.

Total Merchant Tonnage approximate (Steam and Motor) of the World

(Vessels over 100 tons, Lloyd's Register Book, 1936–37)

and Number of Selected Ships required for making W.T. Weather Reports in all Oceans, World Wide.

Country.	Steamers and Motor Vessels.		Percentage of World Tonnage.	Number of Selected Ships required.	Approximate Number of Ships fitted for C.W. Long Wave Transmission (July, 1936)
	Number.	Gross Tons.			
Great Britain and Ireland.	6,891	17,182,857	28·1	281	148
Australia and New Zealand.	523	637,504	1·0	10	—
Canada (excluding Lakes).	620	855,842	1·4	14	15
Hong Kong ...	122	311,999	0·5	5	3
India and Ceylon...	167	223,685	0·4	4	1
South Africa and Other Colonies*.	578	525,587	0·9	9	5
British Empire Total.	8,901	19,737,474	32·3	323	172
America (United States)(excluding Lakes).	2,585	9,515,984	15·6	156	364
Argentine	286	304,677	0·5	5	1
Belgium	179	388,413	0·6	6	8
Brazil	283	475,298	0·8	8	12
Chile	90	139,197	0·2	2	—
China	268	491,580	0·8	8	—
Denmark	695	1,134,029	1·9	19	25
Finland	303	425,369	0·7	7	—
France	1,340	2,972,979	4·9	49	15
Germany	2,085	3,708,202	6·1	61	40
Greece	606	1,800,850	2·9	29	—
Holland	1,408	2,507,354	4·1	41	18
Italy	1,072	3,056,753	5·0	50	149
Japan	2,367	4,215,690	6·9	69	265
Jugo-Slavia ...	177	372,179	0·6	6	—
Latvia	91	169,413	0·3	3	—
Norway	1,857	4,053,655	6·6	66	12
Panama	81	429,350	0·7	7	13
Portugal	198	238,284	0·4	4	13
Russia (Soviet Union).	649	1,214,937	2·0	20	9
Spain	861	1,145,531	1·9	19	13
Sweden	1,244	1,506,557	2·5	25	3
Turkey	175	196,254	0·3	3	—
Other Countries ...	683	898,500	1·4	14	8
Total ...	28,484	61,098,509	100·0	1,000	1,140

* Including Dominion of Newfoundland.

(3) Selected Ships are broadly divided into two types, " A " and " B."

" A " Selected Ships are ships fitted for long range W.T. transmission (Type A.1, C.W. apparatus) mostly mail steamers sailing and arriving at dates fixed by advertised programmes.

" B " Selected Ships are ships fitted for comparatively short range W.T. transmission (Type A.2, I.C.W. apparatus), including passenger and cargo liners sailing according to an advertised programme, as well as a number of vessels whose movements are not advertised and may vary from voyage to voyage.

(4) It is necessary that observations reported by wireless telegraphy should synchronize. The International times of observation for weather telegraphy at sea are 0000, 0600, 1200 and 1800 hours G.M.T.

(5) It is necessary that weather reports made for the information of all ships and the meteorological services of the different countries should be in one code, simple and concise, giving only essential information.

Selected Ships use the International Ships' Wireless Weather Telegraphy Code, 1929.

British Selected Ships.

(6) When British ships become regular voluntary observing ships to the Meteorological Office, London, their Commanders volunteer to carry out the duties of Selected Ships when required.

The names of all British observing ships are published in a fleet list at the end of The Marine Observer, corrected monthly by supplement.

(7) Selected Ships are selected from this list, according to their sailing schedules and trades to provide distribution, according to their wireless apparatus to ensure efficient communication, and according to the capacity and keenness of their officers to ensure the most accurate information.

(8) When observing ships are detailed as Selected Ships, their commanders are specially notified; and each Selected Ship is identified by a number placed before her name in the fleet list, with symbols indicating the nature of her wireless telegraphic apparatus.

(9) There are (Oct. 1st, 1936), 3,690 British ships fitted with wireless telegraphy. The proportion fitted with Type A.1 is about 1 to every 23 fitted with Type A.2 or Type B apparatus.

Of the total of 3,690 British ships fitted with W/T.—

154 are fitted for sending Long Wave, C.W.
222 ,, ,, ,, Short Wave, I.C.W.

Nearly all British ships carrying W/T are capable of receiving on long-wave, whereas far fewer can receive on short wave.

(10) A fairly long range with reliability being desirable, at present long wave, C.W., is the most satisfactory, and British " A " Selected Ships are at present confined to ships so fitted.

Times of Observation.

(11) The following Chart indicates the zones for which the International watch-keeping periods are fixed for wireless operators, all four times of meteorological observation being indicated in each zone.

(12) Many Selected Ships only have one officer in each watch. The first essential for safe navigation is a good lookout kept by the officer of the watch, as well as the lookout man. The officer of the watch is responsible for meteorological observation, and the accuracy of reports. If the officer of the watch at night goes into the lighted chart house to read meteorological instruments and record them, not only does he leave his post of lookout, but he returns to the bridge momentarily blinded.

(13) Wireless meteorological reports are not asked for in British Selected Ships during the hours of darkness in which there is only one officer in each watch.

The times of observation which are starred on the chart are those which generally fall during daylight in the different zones, and at these times all British Selected Ships are requested to record observations for reporting by wireless.

(14) In certain parts of the world " A " Selected Ships having two officers in each watch are requested to record observations at all four times, and report them to certain meteorological services.

Communication.

(15) In order that communication may be effective (that is, that the reports may reach as many ships as possible as well as the appropriate meteorological centres), British Selected Ships work a time schedule for transmitting their reports and use prescribed wave lengths both when addressing specified stations or all ships.

(16) Generally " A " Selected Ships address their reports to specified meteorological centres, making them to specified coast stations, so that they may be intercepted by all ships within range. In parts of the world where coast stations are not detailed to receive routine reports from " A " Selected Ships they broadcast their reports to **C.Q.** (all ships).

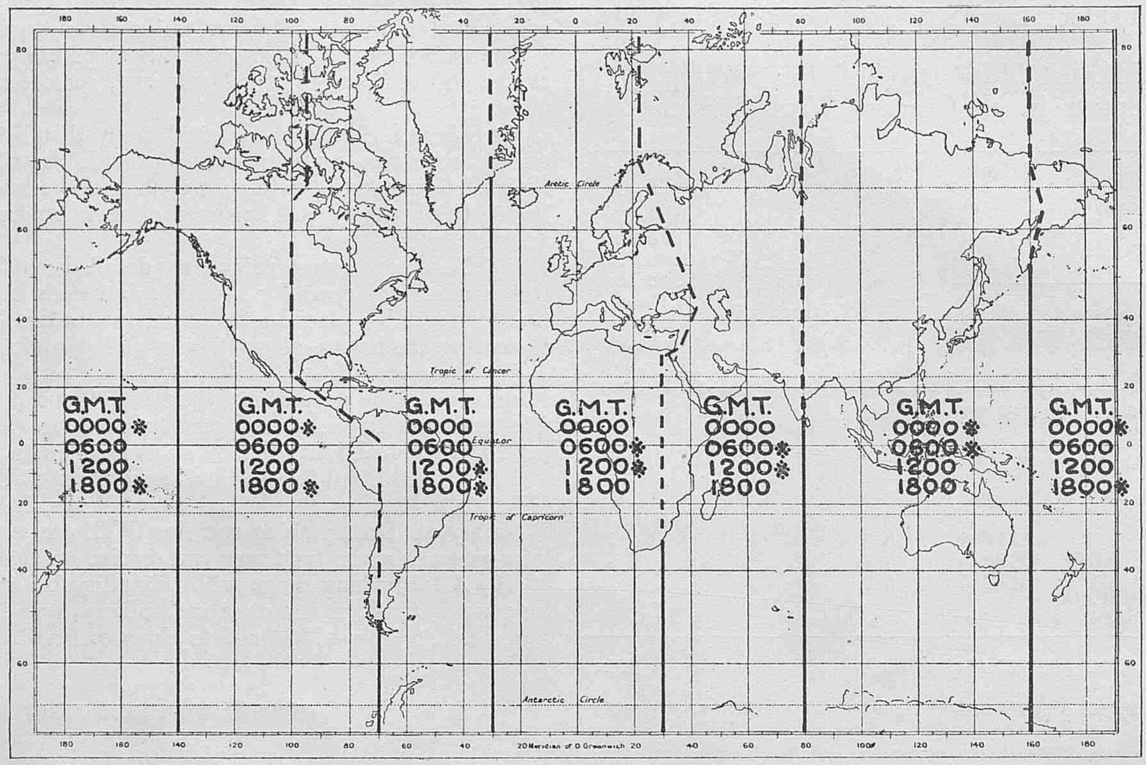
(17) The reports of " B " Selected Ships are primarily intended in all parts of the world for the information of all ships.

Generally " B " Selected Ships address and make their reports to **C.Q.** (all ships) so that they may be intercepted by shore stations within range as well as by other ships.

In parts of the world where there may be insufficient " A " Selected Ships, " B " Selected Ships are requested to address their reports to meteorological centres, making them to coast stations.

International Observation Times for Weather Telegraphy at Sea.

* Indicates usually daylight.



(18) Great importance is attached to the S.O.S. periods of silence. Therefore the times of transmission for " A " Selected Ships are fixed to commence immediately at the end of the appropriate S.O.S. silence period.

This allows a sufficient interval from the time of observation for recording and coding the observations carefully and sending the coded messages from the bridge to the wireless house.

(19) Usually the times of commencement of transmission for " A " and " B " Selected Ships are fixed at 18 minutes and 30 minutes respectively after observation time; but for ships with only one W.T. operator in certain zones, special commencing periods are fixed to accord with wireless watch.

(20) The schedule which follows indicates the times of observation and commencement of times of transmission for both " A " and " B " Selected Ships in the different zones.

Schedule.
All times are G.M.T.

Zones between Greenwich Meridians.	First Weather Report.			Second Weather Report.		
	Times of observations.	Times of reporting by Type A1 (C.W.) Ships.	Times of broadcasting by Type A2 (I.C.W.) and Type B (Spark) Ships.	Times of observations.	Times of reporting by Type A1 (C.W.) Ships.	Times of broadcasting by Type A2 (I.C.W.) and Type B (Spark) Ships.
30° W.–30° E.	0600	0618 0818	0830	1200	1218	1230
30° E.–80° E.	0600	0618 0818	0630 0830	1200	1218	1230
80° E.–160° E.	0000	0018	0030	0600	0618 0818	0830
160° E.–140° W.	0000	0018	0030	1800	1818 2018	2030
140° W.–70° W.	0000	0018	0030	1800	1818 2018	1830 2030
70° W.–30° W.	1200	1218	1230	1800	1818 2018	2030

It will be noted that against some of the observation times there are two times of commencement of periods for transmitting. The second of these times, where two occur, are for single operator ships to report, in cases where they would not be keeping wireless watch following the observation hour. It should be remembered that a large proportion of " Selected Ships " carry two or three operators, and they should use the earlier periods for transmission, also repeating for the benefit of ships with one operator during the second period.

In working this schedule, Selected Ships should be careful not to jam each other.

It may be advantageous for Selected Ships—beyond the region of the Eastern North Atlantic, regulated by Roll Calls, and when not reporting to a shore station—when in W/T communication previous to reporting time to arrange the order in which they will transmit their weather reports to **C.Q.** at the next scheduled time.

(21) For " A " Selected Ships the wave length to be used in reporting to shore stations is specified in a list of stations detailed to receive coded weather reports from " A " Selected Ships, published in the latest number of The Marine Observer. In the Eastern North Atlantic, where there is great congestion of wireless traffic, British Selected Ships work in accordance with roll calls for the day, broadcast from the specified W/T stations for the information of all shipping, particulars of which are given in the detailed list of wireless stations above mentioned.

In parts of the world where there are not stations detailed to receive reports from " A " Selected Ships, they make their reports to **C.Q.** on 2100 metres.

(22) " B " Selected Ships use 600 metres wave length throughout the service in all parts of the world.

The names of stations detailed to intercept or receive weather reports from " B " Selected Ships are given in a list following that for " A " Selected Ships in the latest number of The Marine Observer.

(23) The Chart of the World accompanying the lists of wireless stations detailed to receive or intercept reports from British Selected Ships, at the end of The Marine Observer is revised and kept up to date quarterly. It is intended to illustrate the foregoing description by indicating graphically the stations and their approximate range, or the limits of the areas for which they should be used by British Selected Ships, and for which the details are given in the aforementioned lists.

(24) In order that all ships should know when Selected Ships make their reports, and be able to decode them, a pamphlet M.O. 329, entitled Decode for use with the International Code for Wireless Weather Messages from Ships has been published since May,

1930. This has been placed on board British ships by their owners, and the schedule of communication is now so well known throughout the sea service that jamming and confusion have been much reduced.

All are asked to help in making this voluntary scheme a success.

(25) No communication charges are made to the ship for Selected Ships' routine wireless weather reports broadcast to all ships, or addressed to meteorological centres specified in the lists in the last number of THE MARINE OBSERVER. Wireless weather reports addressed by ships to meteorological centres not conforming to these instructions may be liable to charges.

(26) The number of messages required for this service is comparatively small, when effectively organized.

Relaying on wave lengths specified in (21), (22), and in the lists of stations in THE MARINE OBSERVER (that is to say, wave lengths used for Selected Ship weather reporting) should not be resorted to.

Every endeavour should be made for the reports in areas in which International W/T link or collective ships, such as the French S.S. *Cuba*, are working, to reach those ships, who will relay them to special shore stations for the information of meteorological centres on a special short wave (long range).

The main object of this system is to make one transmission serve as many ships as possible and the appropriate meteorological centre with the information reported.

(27) While there is congestion in the Eastern North Atlantic and Selected Ships and other British ships are therefore indicated by roll call to report, in other parts of the world there may often be insufficient Selected Ships to provide an adequate service of routine reports.

In the regions of heavy weather on the less frequented routes of the Southern Ocean, and particularly in the Hurricane regions during the Hurricane season, British ships other than Selected Ships are asked to assist in this service.

This will be dealt with in (34).

Observation and Coding.

(28) Guidance in observing and recording meteorological elements will be found in the MARINE OBSERVER'S HANDBOOK.

(29) The code, and guidance for its use are given on pages 44 to 47. For working purposes a glazed code card Form 138A with Code Tables and schedule for communication is supplied to the commanders of Selected Ships.

Brief Instructions for the Guidance of British Selected Ships.

(30) The work of "A" and "B" Selected Ships is largely interdependent.

It is essential that observing officers should be conversant with communication as well as being skilled in observation, and the application of the meteorological information; and that wireless operators should be conversant with the general purpose and application of the information communicated as well as skilled in this system of communication.

It is therefore essential that all concerned should be familiar with the whole scheme.

The following brief instructions are intended to assist the Commanders of Selected Ships in regulating the work under their command.

All Selected Ships.

(31) **Observing Officers.**—At the times indicated for observation on the chart, see (13) and (14), carefully enter your observations in the record of synchronized observations, Form 911 or 915.

Code these observations on to the Register, Form 138.

If the message is to be broadcast to **C.Q.** the weather information may be conveniently abbreviated to the four universal groups of figures; and instead of using supplementary groups, information of Ice or Set and Drift of current may be given briefly in plain language.

If the message is to be sent to a meteorological centre, ascertain from the list in the latest MARINE OBSERVER what groups are desired, and make out the message accordingly.

Write out the message on Form 139 and address carefully to **C.Q. Weather** or the specified meteorological centre for the part of the world given in the lists in the latest number of THE MARINE OBSERVER. Send it to the wireless operator just before the commencement of the S.O.S. period following the observation time.

Example. For Meteorological centre.—From **GMLJ** to **GKU** Weather London 20506, 13106, 18603, 88660, 35x08, 54528, 65825.

Example. For all ships.—C.Q. Weather 13167, 55106, 00000, 16979 Current from 15N. 52E. to 16N. 54E. 58 degrees one knot Dalgoma.

"A" Selected Ships.

(32) **Wireless Operator.**—Consult the list of stations detailed to receive reports in THE MARINE OBSERVER.

In the Eastern North Atlantic, when on the roll call transmit the weather report to **GKU.** accordingly on the appointed wave length, following the order of the roll call at the schedule time. The reports for 0000 and 1800 hours G.M.T. should be made as soon as convenient after the silence period.

In parts of the world where the message is addressed to a meteorological centre call the station detailed in THE MARINE OBSERVER at schedule time, see (20), and on the wave length specified, and transmit the report, which will be acknowledged in the ordinary way, remembering that this message is intended for ships within range as well as the shore station.

The message will be addressed to **C.Q.** in parts of the world where there is no station detailed in THE MARINE OBSERVER. Send it out at schedule time on 2100 metres.

Make your transmissions as above with due consideration to circumstances.

"B" Selected Ships.

(33) **Wireless Operator.**—If the message is addressed **C.Q.**, broadcast it at, or following schedule time given in (20) on 600 metres. When in range of stations indicated in the list given in THE MARINE OBSERVER as detailed to intercept wireless weather reports, the message may be intercepted.

In the Eastern North Atlantic, when on the roll call of *GMH* or *GCK*, transmit the weather report to that station on 600 metres wave length, following the order of roll call and at schedule time.

If the message is addressed to a meteorological centre, call the appropriate station indicated in THE MARINE OBSERVER and transmit the message to that station in the usual way.

As far as possible, reports from "B" Selected Ships addressed to a meteorological centre should be made at schedule times, so that they may be intercepted by all ships within range.

If for local reasons these reports addressed to meteorological centres are not made at schedule times and on 600 metres wave length, they should be made also in accordance with schedule to all ships.

Ships' Wireless Weather Reports in Parts of the World where there are not sufficient Selected Ships to provide an adequate Service.

(34) Under Article 34 of the Convention for Safety of Life at Sea, the master of every ship meeting a dangerous tropical storm, is bound by law to report to ships in the vicinity, and to the first point of the coast with which he can communicate (see page 34), but routine wireless weather reporting is **voluntary.**

It is desirable that ships and meteorological centres should as far as possible have routine wireless weather reports in fine as well as in bad weather, so that they may be forewarned.

In any part of the world in the open ocean where and when there are not sufficient Selected Ships to provide an adequate service, and particularly in the Southern Ocean and the regions of tropical revolving storms, British ships which are not Selected Ships are asked to assist in this service.

As far as possible the International Ships' Wireless Weather Telegraphy Code should be used and the procedure for Selected Ships should be carried out. British ships which are not Selected Ships should only make routine wireless weather reports to the shore through stations which have been detailed to receive weather reports without charge to the ship. Such stations are notified in the lists before mentioned in THE MARINE OBSERVER, and these lists are copied in the Admiralty list of Wireless Signals. and are kept up to date by Admiralty Notices to Mariners.

The masters of all British ships are advised to procure the pamphlet, M.O.329, DECODE FOR USE WITH THE INTERNATIONAL CODE FOR WIRELESS WEATHER MESSAGES FROM SHIPS, published and sold by H.M. Stationery Office, through any bookseller, price 6d.

M.O. 379, a HANDBOOK OF WEATHER, CURRENTS, AND ICE FOR SEAMEN, gives guidance in weather forecasting, also published by H.M. Stationery Office, price 4s. 0d.

Additional Local Reports.

(35) If for local reasons, British ships are asked locally to report weather at times other than those of the routine times for British Selected Ships, they are requested to do so if convenient; but British Selected Ships, and British ships carrying on the service where there are not Selected Ships, should in such cases also report at the routine times laid down, so that there may always be a service of routine weather reports made at schedule times for the benefit of navigation.

In certain Dominions and Colonies of the British Empire, where for local reasons observations are desired to be reported additional to those specified in the schedule on page 38 by ships at sea to meteorological centres ashore, Notices to Mariners, specifying a special time of observation, will be published through the appropriate Dominion or Colonial nautical authority.

These reports should be made in the International Ships' Wireless Weather Telegraphy Code.

The observations need not be recorded on the Forms supplied to British Selected Ships, for the return of observations to the Marine Division of the British Meteorological Office, for the purpose of world-wide weather investigation. Records of synchronized observations made at the four International times given in Sections (4), (11) and (20) are sufficient for this purpose.

The following optional additional observation times for reports to shore stations have been notified :—

INDIA.—For the stations named in the lists bordering the Arabian Sea	0300 G.M.T.
HONG KONG.—For the stations named in the lists bordering the China Seas and Western North Pacific	2200 G.M.T.

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM "A SELECTED SHIPS."

Request for Information.

THE ATTENTION OF METEOROLOGICAL SERVICES IS DIRECTED TO THE INVITATION GIVEN ON PAGE 36 OF THIS NUMBER.

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
North Atlantic and North Sea.	Portishead.	Lat. 51° 28′ 41″ N. Long. 2° 47′ 30″ W.	**GKU.**	149 kc/s. (2013 metres) and 121 kc/s. (2479 metres) simultaneously	143 kc/s. (2100 metres).	North Sea and Eastern North Atlantic East of Longitude 40° W. but not within 300 miles of station. (*see* Chart of the World.)	Weather London.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	"Selected Ships" chosen to report in given order notified by station daily at 2300, 0330, and 1030 G.M.T. Roll call thus—Weather London—call sign of chosen "Selected Ships" to report through GKU at schedule times on 2100 m
North Atlantic.	Horta, Azores.	Lat. 38° 32′ N. Long. 28° 38′ W.	**CTG.**	125 kc/s. (2400 metres).	125 kc/s (2400 metres).	Those "A" Selected Ships not in the Roll Call for reporting to Weather London through Portishead, in the Eastern North Atlantic, east of Long. 40°W should report to this station.	Radio Horta.	Weather only, up to seven groups, preferably No. 3 Supplementary Groups.	"A" Selected Ships in the Eastern North Atlantic not on the roll call made through Portishead (described in these notes for Portishead) should report to Horta in accordance with schedule given in the instructions for British "A" Selected Ships.
	Chatham Mass.	Lat. 41° 43′ N. Long. 70° 47′ W.	**WCC.**		142·9kc/s. (2098 metres).	North Atlantic West of Longitude 40° W.	Observer Washington	Weather only. First four groups of observations taken at 0000 and 1200 G.M.T. only required.	All British "A Selected Ships" within area to address their 0000 and 1200 G.M.T. observations to Observer Washington and their 1800 G.M.T. observations to CQ in accordance with schedule.
	Amagansett (Montauk).	Lat. 41° 00′ N. Long. 72° 03′ W.	**WSL.**						
	Thomaston.	Lat. 44° 01′ N. Long. 69° 13′ W.	**WAG.**						
	Jupiter.	Lat. 26° 42′ N. Long. 80° 02′ W.	**WMR.**						
	Palm Beach.	Lat. 26° 42′ N. Long. 80° 02′ W.	**WOE.**						
South Atlantic.	Slangkop (Cape Town)	Lat. 34° 08′ 46″ S. Long. 18° 19′ 18″E.	**ZSC**	—	143 kc/s. (2100 metres).	South Atlantic Westward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	Only 0600 G.M.T. observation required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
Mediterranean.									
Red Sea and Indian Ocean.	Port Sudan.	Lat. 19° 36′ 35″ N. L ong. 37°13′28″E.	**STP**	—	143 kc/s.† (2100 metres).	From Suez to Ras Fartak, Ras Hafun, and western limit of Colombo area.	Weather Khartoum.	Weather only. Four universal groups.	All British "A Selected Ships" within area should report in accordance with Schedule. † Alternatively see particulars on p. 42 and use wave length and times for "B Selected Ships."

WIRELESS STATIONS DETAILED TO RECEIVE ROUTINE CODED WEATHER REPORTS FROM "A SELECTED SHIPS."

(Continued.)

Ocean.	Station.	Position.	Call Sign.	Frequency and Wave Length.		Area and limits covered by Station.	Telegraphic address of Meteorological Centre.	Information required—Limit of Groups.	Notes.
				For Station to call up "Selected Ships."	For "Selected Ships" to report to Station.				
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55′ 40″ S. Long. 30° 58′ 50″E.	**ZSD**	—	143 kc/s. (2100 metres).	Indian Ocean S. of 20° S. and Eastward of 25° E. and within a range of about 2,000 miles of station.	Met.	Weather only. Four universal groups and first group of No. 6 Supplementary groups.	Only 0600 G.M.T. observations required. All British "A Selected Ships" within area should report, commencing at 0618 G.M.T.
	Bombay.	Lat. 19° 04′ 55″ N. Long. 72° 49′ 54″E.	**VWB**	—	143 kc/s. (2100 metres).	Arabian Sea N. of line C. Comorin to Ras Fartak.	Weather.	Weather only. No. 9 Supplementary groups.	See Section (35)
	Madras.	Lat. 12° 59′ 17″ N. Long. 80° 10′ 56″E.	**VWM**	—	143 kc/s. (2100 metres).	Bay of Bengal N. of line C. Comorin to Achin Head.	Weather.	Weather only. No. 9 Supplementary groups.	
	Colombo.	Lat. 6° 55′ 14″ N. Long. 79° 52′ 46″E.	**VPB**	143 kc/s. (2100 metres).	143 kc/s. (2100 metres).	Indian Ocean South of a line Ras Fartak, C. Comorin and Achin Head, and within a range of about 1500 miles.	Weather.	Weather only. No. 6 Supplementary groups preferred.	All British "A Selected Ships" within area should report in accordance with Schedule.
	Mombasa.	Lat. 4° 03′ 11″ S. Long. 39° 39′ 49″E.	**VPQ**	—	125 kc/s. (2400 metres).	From Ras Hafun to Lat. 20° S. when westward of the Colombo area.	Weather Nairobi.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" within area should report 0600 G.M.T. observations.
	Perth.	Lat. 32° 01′ 51″ S. Long.115° 49′31″E.	**VIP**	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	Indian Ocean and Southern Ocean between Long. 90° and 135° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart, p. 38, of this number.
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12′ 39″ N. Long.114°15′11″E.	**VPS**	8330kc/s. (36 metres) or 500 kc/s. (600 metres).	143kc/s.* (2100 metres).	China Sea and North Pacific to about 1,500 miles from station.	Royal Observatory	Weather only No. 9 Supplementary Groups.	All British "A Selected Ships" within area should report in accordance with Schedule. *Alternatively see particulars on p. 43 and use wave length and times for "B Selected Ships."
South Pacific.	Sydney.	Lat. 33° 46′ 00″ S. Long.151° 03′09″E.	**VIS**	125 kc/s. (2400 metres).	143 kc/s. (2100 metres).	S. Pacific Coral and Tasman Seas and Southern Ocean between Long. 135° and 160° E.; but not within 100 miles of the coast.	Weather.	Weather only. No. 6 Supplementary groups.	All British "A Selected Ships" within area should report in accordance with Schedule. Reports not required for observation times not starred on Chart, p. 38, of this number.

WIRELESS STATIONS DETAILED TO INTERCEPT ROUTINE CODED WEATHER REPORTS FROM "B SELECTED SHIPS."

In cases where routine weather reports made to CQ might not be received by the appropriate station within range, indicated in this list, they should be made to that station by call sign, but so that they may be readily intercepted by all ships. 600 m. is used throughout.

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
North Atlantic.	Malin Head.	Lat. 55° 21′ 45″ N. Long. 7° 20′ 30″ W.	**GMH**	Weather London.	Weather in four universal groups only.	Station will indicate at 0805 G.M.T. with ordinary traffic calls, the names of British "B" Selected Ships and other British ships within range and North of Lat. 54° N., and West of Long. 7° W. who are desired to report weather at routine times. Thus:--Call signs of ships to report weather through GMH.
	Valentia.	Lat. 51° 55′ 48″ N. Long. 10° 20′ 54″ W.	**GCK**	Weather London.	Weather in four universal groups only.	Station will indicate at 0825 G.M.T. with ordinary traffic calls, the names of British "B" Selected Ships and other British ships within range, South of Lat. 54° N., and to southward of Ireland West of Long. 7° W., who are desired to report weather at routine times. Thus:—Call signs of ships to report weather through GCK.
South Atlantic.	Salinas.	Lat. 0° 37′ 00″ S. Long. 47° 23′ 00″ W.	**PPL**	Meteoro Rio.	Weather only, including supplementary groups.	
	S. Luiz.	Lat. 2° 31′ 28″ S. Long. 44° 16′ 30″ W.	**PXM**			
	Fortaleza.	Lat. 3° 42′ 49″ S. Long. 38° 30′ 56″ W.	**PPC**			
	Natal.	Lat. 5° 46′ 30″ S. Long. 35° 16′ 20″ W.	**PXN**			
	Olinda.	Lat. 8° 00′ 55″ S. Long. 34° 50′ 40″ W.	**PPO**			
	Amaralina.	Lat. 13° 00′ 50″ S. Long. 38° 28′ 27″ W.	**PPA**			
	Abrolhos.	Lat. 17° 57′ 35″ S. Long. 38° 42′ 00″ W.	**PXH**			
	Victoria.	Lat. 20° 18′ 52″ S. Long. 40° 19′ 06″ W.	**PPT**			
	Rio.	Lat. 22° 59′ 19″ S. Long. 43° 11′ 26″ W.	**PPR**			
	Santos.	Lat. 23° 59′ 22″ S. Long. 46° 18′ 18″ W.	**PPS**			
	Florianopolis.	Lat. 27° 35′ 22″ S. Long. 48° 34′ 17″ W.	**PPF**			
	Juncçao.	Lat. 32° 03′ 22″ S. Long. 52° 08′ 13″ W.	**PPJ**			
Mediterranean.						
Red Sea and Indian Ocean.	Port Sudan	Lat. 19° 36′ 35″ N. Long. 37° 13′ 28″ E.	**STP**	Weather Khartoum.	Weather only, four universal groups.	
Indian Ocean.	Jacobs (Durban).	Lat. 29° 55′ 40″ S. Long. 30° 58′ 50″ E.	**ZSD**	Met.	Weather only, 4 universal groups and first group of No. 6 Supplementary groups.	
	Algoa Bay (Port Elizabeth).	Lat. 33° 57′ 16″ S. Long. 25° 35′ 30″ E.	**ZSQ**	Met.	Weather only, 4 universal groups and first group of No. 6 Supplementary groups.	

WIRELESS STATIONS DETAILED TO INTERCEPT ROUTINE CODED WEATHER REPORTS FROM "B SELECTED SHIPS."

(*Continued.*)

In cases where routine weather reports made to CQ might not be received by the appropriate station within range, indicated in this list, they should be made to that station by call sign, but so that they may be readily intercepted by all ships. 600 m. is used throughout.

Ocean.	Station.	Position.	Call Sign.	Telegraphic address of Meteorological Centre desiring information.	Information desired.	Notes.
Indian Ocean (*continued*).	Calcutta.	Lat. 22° 33′ 31″ N. Long. 88° 20′ 16″ E.	**VWC**	Weather.	Weather only, preferably No. 9 Supplementary Groups.	
	Rangoon.	Lat. 16° 45′ 57″ N. Long. 96° 11′ 51″ E.	**VTR**	Weather.	Weather only, preferably No. 9 Supplementary Groups.	
	Madras.	Lat. 12° 59′ 17″ N. Long. 80° 10′ 56″ E.	**VWM**	Weather.	Weather only, preferably No. 9 Supplementary Groups.	
	Bombay.	Lat. 19° 04′ 55″ N. Long. 72° 49′ 54″ E.	**VWB**	Weather.	Weather only, preferably No. 9 Supplementary Groups.	See Section (35).
	Karachi.	Lat. 24° 51′ 05″ N. Long. 67° 02′ 32″ E.	**VWK**	Weather.	Weather only, preferably No. 9 Supplementary Groups.	See Section (35).
	Matara.	Lat. 6° 01′ 07″ N. Long. 80° 35′ 39″ E.	**GZP**	Weather.		
	Mombasa.	Lat. 4° 03′ 11″ S. Long. 39° 39′ 49″ E.	**VPQ**	Weather Nairobi.		
	Dar-es-Salaam.	Lat. 6° 50′ 38″ S. Long. 39° 17′ 24″ E.	**ZBZ**	Weather Nairobi.		
	Mauritius.	Lat. 20° 23′ 41″ S. Long. 57° 35′ 25″ E.	**VRS**	Observatory Mauritius.	Weather only, 4 universal groups and first of No. 6 Supplementary Groups.	
	Geraldton.	Lat. 28° 47′ 15″ S. Long. 114° 36′ 24″ E.	**VIN**	Weather.	Weather only, preferably No. 6 Supplementary Groups.	
	Esperance.	Lat. 33° 52′ 40″ S. Long. 121° 53′ 34″ E.	**VIE**			
North Pacific and China Sea.	Cape d'Aguilar, Hong Kong.	Lat. 22° 12′ 39″ N. Long. 114° 15′ 11″ E.	**VPS**	Royal Observatory.	Weather only, preferably No. 9 Supplementary Groups.	
South Pacific.	Auckland.	Lat. 36° 50′ 37″ S. Long. 174° 46′ 08″ E.	**ZLD**	Weather Wellington.	Weather only, preferably No. 9 Supplementary Groups.	
	Wellington.	Lat. 41° 16′ 26″ S. Long. 174° 45′ 55″ E.	**ZLW**			
	Awarua.	Lat. 46° 30′ 47″ S. Long. 168° 22′ 24″ E.	**ZLB**			
	Chatham Island.	Lat. 43° 57′ 28″ S. Long. 176° 34′ 25″ W.	**ZLC**			
	Rarotonga.	Lat. 21° 11′ 52″ S. Long. 159° 48′ 52″ W.	**ZKR**			
	Apia.	Lat. 13° 50′ 17″ S. Long. 171° 49′ 42″ W.	**ZMA**			
	Thursday I.	Lat. 10° 35′ 14″ S. Long. 142° 12′ 43″ E.	**VII**	Weather.	Weather only, preferably No. 6 Supplementary Groups.	
	Townsville.	Lat. 19° 16′ 09″ S. Long. 146° 49′ 47″ E.	**VIT**			
	Brisbane.	Lat. 27° 25′ 34″ S. Long. 153° 07′ 19″ E.	**VIB**			
	Melbourne.	Lat. 37° 46′ 56″ S. Long. 144° 52′ 09″ E.	**VIM**			
	Adelaide.	Lat. 34° 51′ 14″ S. Long. 138° 31′ 55″ E.	**VIA**			

INTERNATIONAL SHIPS' WIRELESS WEATHER TELEGRAPHY CODE.

Adopted by the International Meteorological Organization, 1929 and 1935.

Code and Instructions for Coding Messages.

The International Ships' Wireless Weather Code is a figure code, arranged in groups of five figures.

The first four groups are universal and the remaining groups are in three alternative or supplementary sets of groups. The first figure in the fifth group of message (or first supplementary group) indicates which set of supplementary groups is used.

The first four universal groups should always be used, and the supplementary sets of groups may be omitted, or abbreviated by omitting the last group or groups of the set; that is, the code figure message may be shortened as necessary, but the order of the figures and groups must always be strictly maintained, otherwise the message is not decodable.

If an observation or element is not available, an X (or the appropriate number of Xs) (— ● ● —) should take its place in order to maintain the sequence of figures in the groups.

Having entered synchronized weather observations and particulars of set and drift of current and ice in the Ship's Meteorological Record, Form 911, or the Meteorological Log, Form 915 (specially ruled pages at end of book), the observations should be coded, thus—

First. From the list of wireless stations detailed to receive routine coded weather reports from "Selected Ships," ascertain the number of groups and the supplementary groups desired by the shore meteorological services from ships in the part of the world that the ship is in, remembering that the seventh group can only be given completely by ships having a special barograph; and decide on the information to be sent, not forgetting the desirability of information of the set and drift of current, ice, and navigational obstructions being included in reports intended for "all ships," but not through W/T stations for certain meteorological centres. In such cases, brevity being desirable, only the first four or universal groups should be given in code. This ensures the necessary brevity and information for the meteorological centre, and the necessary information for ships at sea. Do not include information in C.W. reports addressed to meteorological centres which they do not require.

Second. On Form 138, the register for coded "Selected Ships" wireless meteorological reports, in No. 1 column write the address of the Meteorological Centre if your ship is fitted for C.W. transmission, but "All Ships' Weather" if Spark.

Universal Groups.

With the Code Card, Form 138A, from synchronized weather observations entered on Form 911 or 915, code as follows :—

KEY LETTERS.

Column 2.—Code the Day of the Week. Table I ... Y

,, 3.—Code the Octant of the Globe. Table II ... Q

,, 4.—Code the Latitude by entering the **whole degrees** (prefixing 0 if necessary to make up two figures); and dividing the minutes by six, neglecting the remainder. Enter the result LLL

,, 5.—Code the Longitude by entering the **whole degrees** (prefixing 0 if necessary to make up two figures, or omitting the initial 1 if Longitude is 100° or over). Divide the minutes by six, neglecting the remainder. Enter the result lll

,, 6.—Enter the hours of the Greenwich Mean Time of Observation ... ... GG

From the Code Card Form 138A.

,, 7.—Code the Direction of the Wind. Table III DD

,, 8.—Code the Force of the Wind, forces 9 and above are entered as 9, but if 10, 11 or 12, add the words Gale, Storm, or Hurricane at the end of the message. Table V ... F

,, 9.—Code the Present Weather. Table VI ... ww

,, 10.—Code the corrected barometer reading by entering the two last whole figures if a millibar barometer, or coding, if inches, by Table VIII ... ... PP

KEY LETTERS.

Column 11.—Enter the Visibility by Scale. Table XII ... V

,, 12.—Enter the Air Temperature in whole degrees Fahrenheit, omitting the initial 1, if over 100° ... ... TT

No. 3 Supplementary Groups.

If these groups have been decided upon, in Column 13 enter "3" as distinguishing number for the remainder of the coded message.

KEY LETTERS.

Column 14.—Code type of Lower Cloud. Table XIII ... C_L

,, 15.—Code type of Middle Cloud. Table XIV ... C_M

,, 16.—Code type of Upper Cloud. Table XV ... C_H

,, 17.—Code the total amount of sky covered. Table XVII ... ... N

,, 18.—Subtract the lesser from the greater of the Air and Sea Temperatures and code the result with Table XVIII ... ... t_d

,, 19.—Enter the Swell by Scale. Table XIX ... K

,, 20.—Code the True Direction of Swell. Table IV d

,, 21.—Code the Past Weather. Table VII ... W

,, 22.—Code the proportion of sky covered with Lower Cloud. Table XVII ... ... N_L

,, 23.—Code the course of ship. Table IV ... ... d_s

,, 24.—Code the speed of the ship. Table XXI ... f

,, 25.—Code the characteristic of the Tendency of the Barometer, as shown by barograph Table X ... ... a

,, 26.—Code the Amount of rise or fall of the Barometer in the last 3 hours. Table XI... bb

No. 6. Supplementary Groups.

If these groups have been decided upon, in Column 27 enter "6" as distinguishing number for the remainder of the coded message.

KEY LETTERS.

Column 28.—Enter the Swell by Scale. Table XIX ... K

,, 29.—Code the True Direction of the Swell. Table IV ... ... d

,, 30.—Code the Predominating type of Cloud. Table XVI C

,, 31.—Code the total amount of sky covered. Table XVII ... ... N

,, 32.—Subtract the lesser from the greater of the Air and Sea Temperatures and code the result. Table XVIII ... ... t_d

,, 33.—Code the Course of the Ship. Table IV ... d_s

,, 34.—Code the recorded change of the barometer in the last two, three, or four hours. Table IX ... ... A

,, 35.—Code the Past Weather. Table VII ... W

,, 36.—Code type of Upper Cloud. Table XV ... C_H

No. 9. Supplementary Groups.

If these groups have been decided upon, in Column 37 enter "9" as distinguishing number for the remainder of the coded message.

KEY LETTERS.

Column 38.—Enter the Sea and Swell by Douglas Scale. Table XX ... ... SK

,, 39.—Code the True Direction of the Swell. Table IV ... ... d

,, 40.—Code the Past Weather. Table VII ... W

,, 41.—Code the Predominating type of Cloud. Table XVI C

,, 42.—Code the total amount of sky covered. Table XVII ... ... N

,, 43.—Code the proportion of sky covered with Lower Cloud. Table XVII... ... ... N_L

,, 44.—Code the recorded change of the barometer in the last two, three or four hours. Table IX ... ... A

,, 45.—Subtract the lesser from the greater of the Air and Sea Temperatures and code the result. Table XVIII ... ... t_d

For messages which are to be broadcast to **C.Q.** or made to shore services indicated in the list of W/T stations in The Marine Observer as requiring such information, in Column 46, enter briefly in plain language the set and drift of current experienced, with position **from** and **to,** Ice or other navigational obstructions.

On no account should svch information be entered in messages for shore services that do not require it.

The ship's call sign should be given in the usual way in sending the report.

In Column 47.—After the message has been despatched enter the call sign of the station through which it was sent, with wave length, or **C.Q.,** as the case may be.

In Column 48.—After the message is sent enter the exact time (G.M.T.) of despatch.

Be sure that your message is correctly coded, and that you have not duplicated the Supplementary Groups.

Write out the message on the signal pad (Form 139) provided and send to the wireless operator for despatch in accordance with instructions given in World Wide System of Voluntary Selected Ship Routine Wireless Weather Reports, pages 36 to 40, schedule for which is also given on Code Card Form 138A.

CODE TABLES.

Day and Position.

Table 1.

Y.—Day of the Week.

	Code Figure.		Code Figure.
Sunday	1	Thursday	5
Monday	2	Friday	6
Tuesday	3	Saturday	7
Wednesday	4		

Table II.

Q.—Octant of the Globe.

	Longitude.	Code Figure.
North Latitude.	0° W. — 90° W.	0
	90° W. — 180° W.	1
	180° E. — 90° E.	2
	90° E. — 0° E.	3
South Latitude.	0° W. — 90° W.	5
	90° W. — 180° W.	6
	180° E. — 90° E.	7
	90° E. — 0° E.	8

Compass.

Table III.

DD.—Compass Table for Wind Direction to points.

True Direction.	Code Figures.	True Direction.	Code Figures.
Calm	00	S. by W.	17
N. by E.	01	S.S.W.	18
N.N.E.	02	S.W. by S.	19
N.E. by N.	03	S.W.	20
N.E.	04	S.W. by W.	21
N.E. by E.	05	W.S.W.	22
E.N.E.	06	W. by S.	23
E. by N.	07	W.	24
E.	08	W. by N.	25
E. by S.	09	W.N.W.	26
E.S.E.	10	N.W. by W.	27
S.E. by E.	11	N.W.	28
S.E.	12	N.W. by N.	29
S.E. by S.	13	N.N.W.	30
S.S.E.	14	N. by W.	31
S. by E.	15	N.	32
S.	16		

Table IV.

d and d_s.—Compass Table to Half Cardinal Points.

True Direction.	Code Figure.
No Sea or Swell; or Ship hove to	0
N.E.	1
E.	2
S.E.	3
S.	4
S.W.	5
W.	6
N.W.	7
N.	8
No observation or no information	9

Wind.

Table V.

F.—Wind Force, Beaufort Scale.

Beaufort Number.		Code Figure.
Nought.	Calm	0
One.	Light airs	1
Two.	Light breeze	2
Three.	Gentle breeze	3
Four.	Moderate breeze	4
Five.	Fresh breeze	5
Six.	Strong breeze	6
Seven.	Moderate gale	7
Eight.	Fresh gale	8
Nine.	Strong gale	9
Ten.	Whole gale	9 Gale*
Eleven.	Storm	9 Storm*
Twelve.	Hurricane	9 Hurricane*

* These words to be written at end of weather message.

Weather.

Table VI.

ww.—Present Weather. (Abridged for British Ships.)

	Code Figures.
Cloudless	00
Partly cloudy	01
Cloudy	02
Overcast	03
Haze (but visibility greater than one mile)	05
Distant Lightning	07
Mist	08
Precipitation within sight	10
Thunder, without precipitation at the ship or station	11
Ugly threatening appearance of sky	13
Squally weather	14
Heavy Squalls in last three hours	15
Waterspout seen in last three hours	16
Signs of a tropical storm forming	18
Signs that a tropical storm has formed	19
Precipitation (rain, drizzle, hail, snow or sleet) in last hour, but not at time of observation	20
Dust or Sand storm	30
Fog	40
Moderate fog in last hour	41
Thick fog in last hour	42
Fog in patches	49
Drizzle	50
Drizzle and Fog	57
Slight or moderate drizzle and rain	58
Thick drizzle and rain	59
Rain	60
Rain and fog	67
Slight or moderate rain and snow	68
Heavy rain and snow	69
Snow or Sleet	70
Shower or showers	80
Showers of slight or moderate hail, or rain and hail	88
Showers of heavy hail, or rain and hail	89
Thunderstorm	90

Preference should be given to 18 and 19 when they apply, otherwise to the largest number of this code which applies to the weather at the position of the ship at the time of observation.

Table VII.

W.—Past Weather.

	Code Figure.
Fair (clear or slightly clouded)	0
Variable sky	1
Mainly overcast	2
Sandstorm or duststorm, or storm of drifting snow	3
Fog or thick dust haze (visibility less than five cables) ...	4
Drizzle	5
Rain	6
Snow or sleet	7
Showers	8
Thunderstorm	9

Barometer.

Table VIII.

P.P.—Code Table for corrected barometer readings in millibars and inches.

(Adapted for British Ships.)

Mb.	In.	Code Figs.	Mb.	In.	Code Figs.	Mb.	In.	Code Figs.	Mb.	In.	Code Figs.
925	27·32	25	960	28·35	60	995	29·38	95	1025	30·27	25
926	27·35	26	961	28·38	61	996	29·41	96	1026	30·30	26
927	27·38	27	962	28·41	62	997	29·44	97	1027	30·33	27
928	27·41	28	963	28·44	63	998	29·47	98	1028	30·36	28
929	27·44	29	964	28·47	64	999	29·50	99	1029	30·39	29
930	27·46	30	965	28·50	65	1000	29·53	00	1030	30·42	30
931	27·49	31	966	28·53	66	1001	29·56	01	1031	30·45	31
932	27·52	32	967	28·56	67	1002	29·59	02	1032	30·48	32
933	27·55	33	968	28·59	68	1003	29·62	03	1033	30·51	33
934	27·58	34	969	28·62	69	1004	29·65	04	1034	30·53	34
935	27·61	35	970	28·65	70	1005	29·68	05	1035	30·56	35
936	27·64	36	971	28·67	71	1006	29·71	06	1036	30·59	36
937	27·67	37	972	28·70	72	1007	29·74	07	1037	30·62	37
938	27·70	38	973	28·73	73	1008	29·77	08	1038	30·65	38
939	27·73	39	974	28·76	74	1009	29·80	09	1039	30·68	39
940	27·76	40	975	28·79	75	1010	29·83	10	1040	30·71	40
941	27·79	41	976	28·82	76	1011	29·86	11	1041	30·74	41
942	27·82	42	977	28·85	77	1012	29·89	12	1042	30·77	42
943	27·85	43	978	28·88	78	1013	29·92	13	1043	30·80	43
944	27·88	44	979	28·91	79	1014	29·94	14	1044	30·83	44
945	27·91	45	980	28·94	80	1015	29·97	15	1045	30·86	45
946	27·94	46	981	28·97	81	1016	30·00	16	1046	30·89	46
947	27·97	47	982	29·00	82	1017	30·03	17	1047	30·92	47
948	28·00	48	983	29·03	83	1018	30·06	18	1048	30·95	48
949	28·03	49	984	29·06	84	1019	30·09	19	1049	30·98	49
950	28·05	50	985	29·09	85	1020	30·12	20	1050	31·01	50
951	28·08	51	986	29·12	86	1021	30·15	21	1051	31·04	51
952	28·11	52	987	29·15	87	1022	30·18	22	1052	31·07	52
953	28·14	53	988	29·18	88	1023	30·21	23	1053	31·10	53
954	28·17	54	989	29·21	89	1024	30·24	24	1054	31·13	54
955	28·20	55	990	29·24	90						
956	28·23	56	991	29·26	91						
957	28·26	57	992	29·29	92						
958	28·29	58	993	29·32	93						
959	28·32	59	994	29·35	94						

NOTE.—It will be seen that the code figures may represent two values of barometric pressure, but this only takes place with a very high or a very low barometer, so that recipients of a message will be able to decide which value is intended.

Table IX.

A—Change of Barometer in last 2, 3 or 4 hours.

(Adapted for British Ships.)

(The change in 3 hours should be given if possible.)

	In 2 hours.	In 3 hours.	In 4 hours.	Code Figure.
Barometer **steady**—Has not risen or fallen more than	0·3 mb. (·01 in.)	0·5 mb. (·01 in.)	0·7 mb. (·02 in.)	0
Barometer **rising slowly**—Has risen.	0·7–1·0 mb. (·02–·03 in.)	1·0–1·5 mb. (·03–·05 in.)	1·3–2·0 mb. (·04–·06 in.)	1
Barometer **rising**—Has risen	1·4–2·4 mb. (·05–·07 in.)	2·0–3·5 mb. (·06–·10 in.)	2·8–4·8 mb. (·08–·14 in.)	2
Barometer **rising quickly**—Has risen.	2·6–4·0 mb. (·08–·12 in.)	4·0–6·0 mb. (·12–·18 in.)	5·2–8·0 mb. (·15–·24 in.)	3
Barometer **rising very rapidly**—Has risen.	over 4·0 mb. (·12 in.)	over 6·0 mb. (·18 in.)	over 8·0 mb. (·24 in.)	4
Barometer **falling slowly**—Has fallen.	0·7–1·0 mb. (·02–·03 in.)	1·0–1·5 mb. (·03–·05 in.)	1·3–2·0 mb. (·04–·06 in.)	5
Barometer **falling** — Has fallen.	1·4–2·4 mb. (·05–·07 in.)	2·0–3·5 mb. (·06–·10 in.)	2·8–4·8 mb. (·08–·14 in.)	6
Barometer **falling quickly**—Has fallen.	2·6–4·0 mb. (·08–·12 in.)	4·0–6·0 mb. (·12–·18 in.)	5·2–8·0 mb. (·15–·24 in.)	7
Barometer **falling very rapidly**—Has fallen.	over 4·0 mb. (·12 in.)	over 6·0 mb. (·18 in.)	over 8·0 mb. (·24 in.)	8

Barograph.

Table X.

a.—Characteristic of changes of the Barometer in the last three hours.

(Adapted for British Ships.)

	Description of Changes.	Code Figure.
Net result, Barometer same or higher.	Barometer rising at first, then falling by a smaller or like amount	0
	Barometer rising at first, then steady or rising less quickly...	1
	Barometer unsteady, but generally rising or stationary	2
	Barometer steady or rising	3
	Barometer falling or steady at first, then rising by the same or larger amount	4
	Barometer rising, at an increasing rate	
Net result, Barometer lower.	Barometer falling at first, then rising by a smaller amount	5
	Barometer falling at first, then steady or falling less quickly	6
	Barometer unsteady, but falling	7
	Barometer falling	8
	Barometer steady or rising at first, then falling by a larger amount	9
	Barometer falling, at an increasing rate	

NOTE.—These changes can generally only be given by ships which have special barographs on board.

For illustration of these characteristic changes and guidance see MARINE OBSERVERS HANDBOOK.

Table XI.

bb.—Amount of Rise or Fall of the Barometer in the last three hours.

(Adapted for British Ships.)

Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.	Amount of Rise or Fall.		Code Figs.
Mbs.	Inches.		Mbs.	Inches.		Mbs.	Inches.		Mbs.	Inches.	
0·2	·01	01	4·6	·14	23	9·0	·27	45	13·4	·40	67
0·4	·01	02	4·8	·14	24	9·2	·28	46	13·6	·41	68
0·6	·02	03	5·0	·15	25	9·4	·28	47	13·8	·41	69
0·8	·02	04	5·2	·16	26	9·6	·29	48	14·0	·42	70
1·0	·03	05	5·4	·16	27	9·8	·29	49	14·2	·43	71
1·2	·04	06	5·6	·17	28	10·0	·30	50	14·4	·43	72
1·4	·04	07	5·8	·17	29	10·2	·31	51	14·6	·44	73
1·6	·05	08	6·0	·18	30	10·4	·31	52	14·8	·44	74
1·8	·05	09	6·2	·19	31	10·6	·32	53	15·0	·45	75
2·0	·06	10	6·4	·19	32	10·8	·32	54	15·2	·46	76
2·2	·07	11	6·6	·20	33	11·0	·33	55	15·4	·46	77
2·4	·07	12	6·8	·20	34	11·2	·34	56	15·6	·47	78
2·6	·08	13	7·0	·21	35	11·4	·34	57	15·8	·47	79
2·8	·08	14	7·2	·22	36	11·6	·35	58	16·0	·48	80
3·0	·09	15	7·4	·22	37	11·8	·35	59	16·2	·49	81
3·2	·10	16	7·6	·23	38	12·0	·36	60	16·4	·49	82
3·4	·10	17	7·8	·23	39	12·2	·37	61	16·6	·50	83
3·6	·11	18	8·0	·24	40	12·4	·37	62	16·8	·50	84
3·8	·11	19	8·2	·25	41	12·6	·38	63	17·0	·51	85
4·0	·12	20	8·4	·25	42	12·8	·38	64	17·2	·52	86
4·2	·13	21	8·6	·26	43	13·0	·39	65	17·4	·52	87
4·4	·13	22	8·8	·26	44	13·2	·40	66			

Visibility.

Table XII.

V.—Visibility.

	Code Figure.
Dense fog. Objects not visible at 50 yards.	0
Thick fog. Objects not visible at 1 cable	1
Fog. Objects not visible at 2 cables	2
Moderate fog. Objects not visible at ½ mile (nautical) ...	3
Mist or haze, or very poor visibility. Objects not visible at 1 mile (nautical)	4
Poor visibility. Objects not visible at 2 miles (nautical) ...	5
Moderate visibility. Objects not visible at 5 miles (nautical)	6
Good visibility. Objects not visible at 10 miles (nautical) ...	7
Very good visibility. Objects not visible at 30 miles (nautical)	8
Excellent visibility. Objects visible more than 30 miles ...	9

Clouds.

Table XIII.

C_L.—Form of Low Cloud.

Form of Cloud.	Code Figure.
No low clouds	0
Cumulus of fine weather	1
Cumulus (Large, without anvil)	2
Cumulonimbus	3
Stratocumulus (spread from Cumulus)	4
Stratus or Stratocumulus (in layer)	5
Scud	6
Cumulus **and** Stratocumulus of fine weather	7
Cumulus, large (or Cumulonimbus) **and** Stratocumulus	8
Cumulus, large (or Cumulonimbus) **and** Scud	9

Table XIV.

C_M.—Form of Middle Cloud.

Form of Cloud.	Code Figure.
No middle cloud	0
Altostratus, typical thin	1
Altostratus, typical thick (Sun or Moon invisible), or Nimbostratus	2
Altocumulus or high Stratocumulus, single layer	3
Altocumulus, in bands, decreasing	4
Altocumulus, in bands, increasing	5
Altocumulus, spread out from Cumulus	6
Altocumulus with Altostratus; or Altostratus with parts resembling Altocumulus	7
Altocumulus Castellatus (Altocumulus in ragged fragments)	8
Altocumulus in several layers, generally with fibrous veils and chaotic appearance of sky	9

Table XV.

C_H.—Form of Upper Cloud (Cirrus Cloud).

Form of Cloud.	Code Figure.
No upper clouds (cirrus type)	0
Cirrus, fine, not increasing; scarce	1
Cirrus, fine, not increasing; plentiful, but not a continuous layer	2
Cirrus, anvil	3
Cirrus, fine, increasing	4
Cirrus or Cirrostratus increasing, below 45° altitude	5
Cirrus or Cirrostratus increasing, and reaching above 45° altitude	6
Cirrostratus veil covering whole sky	7
Cirrostratus, not increasing, and not covering whole sky	8
Cirrocumulus predominating, and a little Cirrus	9

Table XVI.

C.—Predominating Form of Cloud.

Form of Cloud.	Code Figure.
Cirrus	1
Cirrostratus	2
Cirrocumulus	3
Altocumulus	4
Altostratus	5
Stratocumulus	6
Nimbostratus	7
Cumulus or Fractocumulus	8
Cumulonimbus	9
Stratus or Fractostratus	0

Table XVII.

N. and (N_L).—Amount of Cloud.

Proportion of Sky covered, in tenths.	Code Figure.
0	0
Less than 1	1
1	2
2 to 3	3
4 to 6	4
7 to 8	5
9	6
More than 9, but with openings	7
10, completely covered	8
Sky obscured by fog, duststorm or other phenomenon	9

Temperatures.

Table XVIII.

t_d.—Difference between Air and Sea Surface Temperature.

	Code Figure.
Air Temperature **higher** than Sea Temperature.	
More than 9° Fahrenheit	0
6° to 9° ,,	1
3° to 6° ,,	2
1° to 3° ,,	3
0° to 1° ,,	4
Air Temperature **lower** than Sea Temperature.	
0° to 1° Fahrenheit	5
1° to 3° ,,	6
3° to 6° ,,	7
6° to 9° ,,	8
More than 9° ,,	9

Swell.

Table XIX.

K.—Swell.

	Code Figure.
No swell	0
Low swell, short or average length	1
Low swell, long	2
Moderate swell, short	3
Moderate swell, average length	4
Moderate swell, long	5
Heavy swell, short	6
Heavy swell, average length	7
Heavy swell, long	8
Confused swell	9

Douglas Sea and Swell Scale.

Table XX.

SK.—Sea and Swell.

SEA.	SWELL.									
		Low.		Moderate.			Heavy.			
	No Swell. 0	Short or Average. 1	Long. 2	Short. 3	Average. 4	Long. 5	Short. 6	Average. 7	Long. 8	Confused. 9
0 Calm	00	01	02	03	04	05	06	07	08	09
1 Smooth	10	11	12	13	14	15	16	17	18	19
2 Slight	20	21	22	23	24	25	26	27	28	29
3 Moderate	30	31	32	33	34	35	36	37	38	39
4 Rough	40	41	42	43	44	45	46	47	48	49
5 Very rough	50	51	52	53	54	55	56	57	58	59
6 High	60	61	62	63	64	65	66	67	68	69
7 Very high	70	71	72	73	74	75	76	77	78	79
8 Precipitous	80	81	82	83	84	85	86	87	88	89
9 Confused	90	91	92	93	94	95	96	97	98	99

Speed.

Table XXI.

f.—Speed of Ship.

Speed in Knots.	Code Figure.
Ship stopped	0
1 to 3 knots	1
4 to 6 ,,	2
7 to 9 ,,	3
10 to 12 ,,	4
13 to 15 ,,	5
16 to 18 ,,	6
19 to 21 ,,	7
22 to 24 ,,	8
More than 24 knots	9

PERSONNEL.

The Marine Superintendent will be glad to receive information of distinctions gained and retirements, &c., of Marine Observers.

PROMOTIONS AND AWARDS.

Captain David Nicoll has been promoted to the post of Marine Superintendent of the Union Castle Line in succession to Captain C. E. Mumford whose retirement is noted below.

Captain Nicoll joined the Union Castle Line in 1901, and obtained command in 1927. Since 1933 he has been the Company's Marine Superintendent at Cape Town. C. H. W.

RETIREMENT.

Captain C. E. Mumford has retired from the post of Marine Superintendent of the Union Castle Line, owing to ill health, after 39 years' service with that Company.

Charles Everard Mumford first went to sea in 1888 as an apprentice in the well known sailing ship company of Devitt and Moore. After one voyage in their 900 ton barque *Duke of Atholl* he was transferred to the ship *Macquarie* of the same owners, in which ship he served for seven years, as apprentice, then as 3rd Mate and, for the last two years, as 2nd Mate.

He then left sail for steam and was 2nd Mate of the S.S. *Obi* of the Mercantile Steamship Company for about a year.

Joining the Union Steamship Company in October, 1897, as 5th Officer, he was promoted through the various grades and was Chief Officer by 1910.

Captain Mumford was appointed to the command of the S.S. *Ipu* on the Company's East African Coast Service in 1918, and after commanding a number of the Company's other ships, he was appointed Marine Superintendent in London in 1925.

For his service as Chief Officer during the European War he was awarded the Order of the White Eagle with Swords (Class 5) by the King of the Serbs, Croats and Slovenes.

We wish him improved health with which to enjoy his retirement.
C.H.W.

Captain Joseph Ross, commander of the R.M.M.V. *Reina del Pacifico* and Commodore of the Pacific Steam Navigation Company, has retired from active service afloat.

Commencing his career in 1889, he served his apprenticeship in the barque *Myrtle Holme* of Maryport, and was subsequently 2nd mate and mate of the *Eden Holme.*

In 1900 he obtained his master's certificate and joined the Pacific Line as a junior officer. During the war years he served in H.M. Ships *Orbita*, *Laburnum* and *Auricula*. Upon his return to the P.S.N.Co. he was promoted to command the *Acajutla*, and in the last 17 years has had charge of many observing ships, including *Orcoma, Orbita, Oropesa* and the motor liner *Reina del Pacifico.* M.C.

OBITUARY.

With deep regret we record the following :—

Commodore Sir Edgar T. Britten, R.D., R.N.R., Commander of the R.M.S. *Queen Mary*, died at Southampton, on 28th October, 1936.

Sir Edgar collapsed in his cabin on sailing morning and was taken ashore to a nursing home where he died later in the day.

Born at Bradford in 1874, and educated at King Edward VI Grammar School, Birmingham, Edgar T. Britten served his time in the ships *Jessie Osborne* and *British Merchant*. Continuing in sail he served as 2nd mate of the barque *Birnham Wood* and as 2nd and 1st mate of the barque *Kinfauns*. After obtaining his master's certificate he transferred to steam, joining the Cunard Line in 1901 as a junior officer.

Promoted to his first command the *Phrygia* in 1913, he has since commanded several of the principal ships of the Cunard Fleet. His commands include the *Pannonia, Vardulia, Verbania, Laconia, Mauretania, Franconia, Aquitania, Berengaria* and *Queen Mary.*

In 1934 a knighthood was conferred upon him by His late Majesty King George V, and, upon the merging of the Cunard–White Star Lines, Sir Edgar was appointed first Commodore of the combined fleet. J. H.

Captain C. E. Homan, Elder Brother of Trinity House, died at Burley, Hants, on Tuesday, 1st December, 1936.

Born in London in 1882, Charles Ernest Homan went to sea at the age of 16 as an apprentice in the barque *Oimara*. He also served in the ship *Valkyrie.*

In February, 1902, upon passing for 2nd Mate, he became 3rd Mate of Scrutton's S.S. *Sibun*. In December, 1902, he joined the Glen Line, and was appointed Fourth Officer of S.S. *Glenturret.*

He passed for Master in February, 1907, and was promoted to Chief Officer in 1908, shortly after which he was lent by the Glen Line for service in Mr. Gordon Bennett's yacht *Lysistrata.*

During the war, he saw service in a number of vessels, including the Fleet Messenger *Osmanieh*, in which ship on 17th March, 1917, they sank an enemy submarine in action by gunfire, 50 miles east of Malta.

Upon returning to the Glen Line in 1920 he was appointed Chief Officer of the *Glenade*, and in February, 1921, Commander of the *Glenogle*. In July, 1926, Captain Homan transferred to the motor vessel *Glenamoy*, in which ship much useful work was done in establishing the system of organized ship's routine wireless weather telegraphy, which is now becoming of such value to navigation and aerial navigation.

Since November, 1929, he had been a Younger Brother of Trinity House, and was elected an Elder Brother on 13th November, 1930.
L. A. B. S.

Captain A. J. Hosken, Commander of the R.M.S. *Empress of Canada*, died at Vancouver.

Captain Hosken joined the Canadian Pacific Steam Ship Co. as a junior officer in 1904 and was promoted to command in 1914, his first ship being the S.S. *Monteagle* employed in the Atlantic trade. In 1922 he transferred to the Pacific in command of the *Empress of Russia* and retained that command until 1935 when he transferred to the *Empress of Canada.* J.H.

Captain H. A. J. Kershaw died recently in the United States after a short illness.

He was the Marine Superintendent of the Union Castle Line in New York, which post he had held since 1925.

His early days at sea were spent in the employ of Messrs. Hine Brothers, in whose service he was apprentice, 2nd Officer, and Chief Officer. Joining the Union Castle Line in 1900 as 3rd Officer, he was promoted through the various grades and obtained command in 1925 and, as stated above, received his shore appointment in the same year.
C.H.W.

Captain J. MacMahon, R.D., R.N.R., of the Union Castle Liner *Edinburgh Castle*, died shortly after his ship arrived at Southampton recently.

Joseph MacMahon was born in 1874 and went to sea in 1890 in Devitt and Moore's ship *Hesperus*. From 1891 to 1898 he served as apprentice and as 3rd Mate in sailing ships of the New Zealand Shipping Company, and had entered the R.N.R. as a Midshipman in 1892. After leaving sail he was 2nd Officer of S.S. *Alcedo* and of S.S. *Nigretia* before joining the Union Castle Line in 1905 as a 3rd Officer. During the European War he was in H.M.S. *Vindex* and H.M.S. *Kildonan Castle*, retiring from the R.N.R. in 1919 with the rank of Commander.

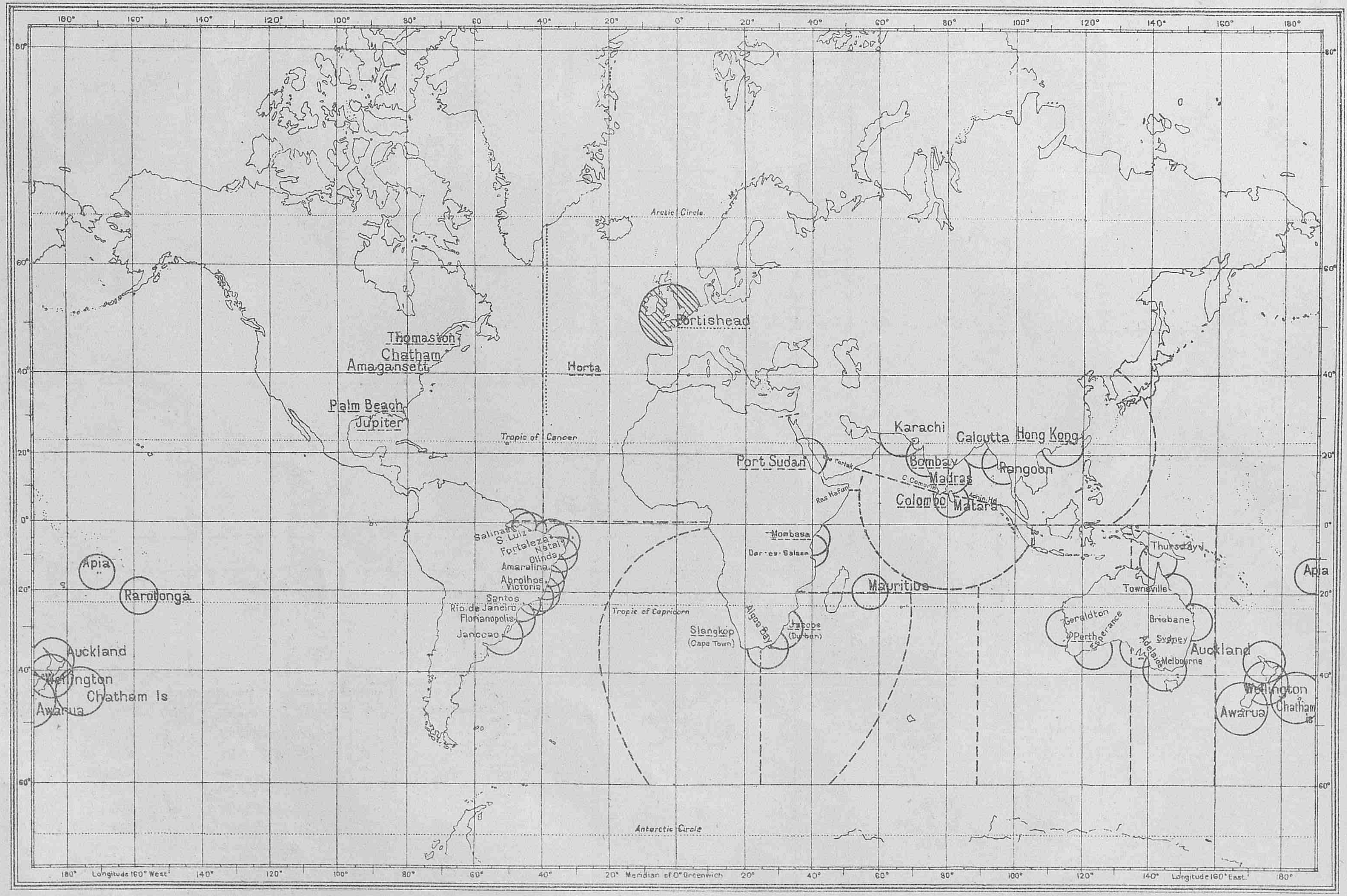
Captain MacMahon was given his first command in the Company in 1927 when he was appointed to S.S. *Dromore Castle.*

After commanding several other ships he was appointed to R.M.S. *Edinburgh Castle* in 1935. C.H.W.

SHIPS' WIRELESS WEATHER SIGNALS.

CHART OF THE WORLD.

Stations for Reception of Routine Wireless Weather Reports from "Selected Ships."


Arctic Circle
Tropic of Cancer
Tropic of Capricorn
Antarctic Circle
Meridian of 0° Greenwich
Longitude 160° West
Longitude 160° East
Portishead
Horta
Thomaston
Chatham
Amagansett
Palm Beach
Jupiter
Port Sudan
Fartak
Ras Hafun
Karachi
Calcutta
Hong Kong
Bombay
Madras
Rangoon
C. Comorin
Colombo
Matara
Achin Hd
Mombasa
Dar-es-Salaam
Mauritius
Slangkop
(Cape Town)
Algoa Bay
Jacobs
(Durban)
Salinas
S. Luiz
Fortaleza
Natal
Olinda
Amaralina
Abrolhos
Victoria
Santos
Rio de Janeiro
Florianopolis
Janoceo
Apia
Rarotonga
Auckland
Wellington
Chatham Is
Awarua
Thursday I.
Townsville
Geraldton
Perth
Esperance
Brisbane
Sydney
Adelaide
Melbourne
Chatham Is
180°
160°
140°
120°
100°
80°
60°
40°
20°
0°

⋮ The dotted line indicates the area in which British "A Selected Ships" report under control to Portishead

— — — A pecked line indicates the reporting area round stations in other countries to which British "A Selected Ships" should report. The names of such stations being underlined with a pecked line

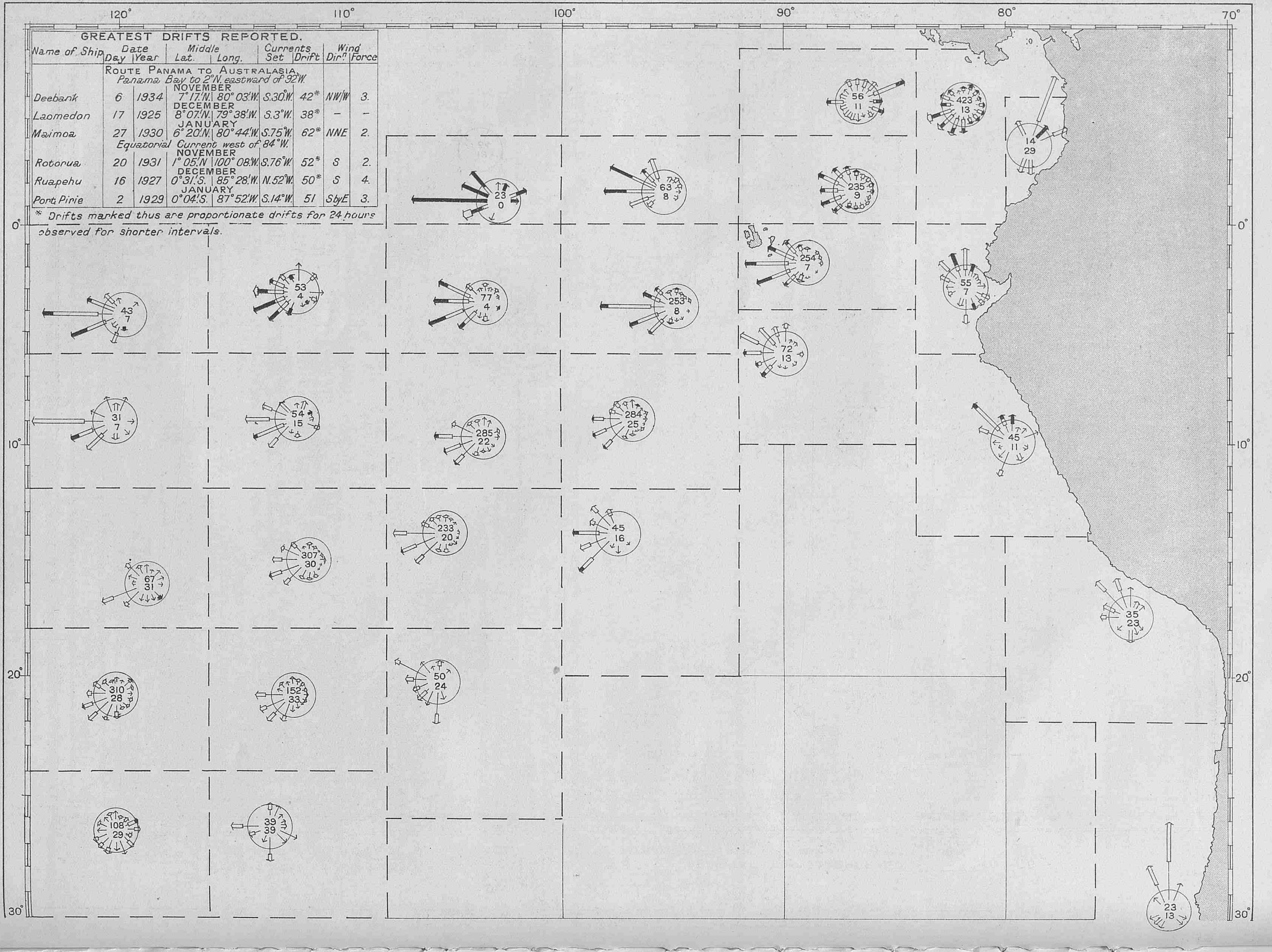
▨ The small shaded areas round stations detailed to receive reports from "A Selected Ships" indicate where these ships should not report on account of congestion.

○ The full circles indicate the areas round islands and coast stations which are detailed to intercept "B Selected Ships" reports made to C.Q. on 600 metres.

CURRENTS IN THE EASTERN PORTION OF THE SOUTH PACIFIC.

NOVEMBER DECEMBER and JANUARY.

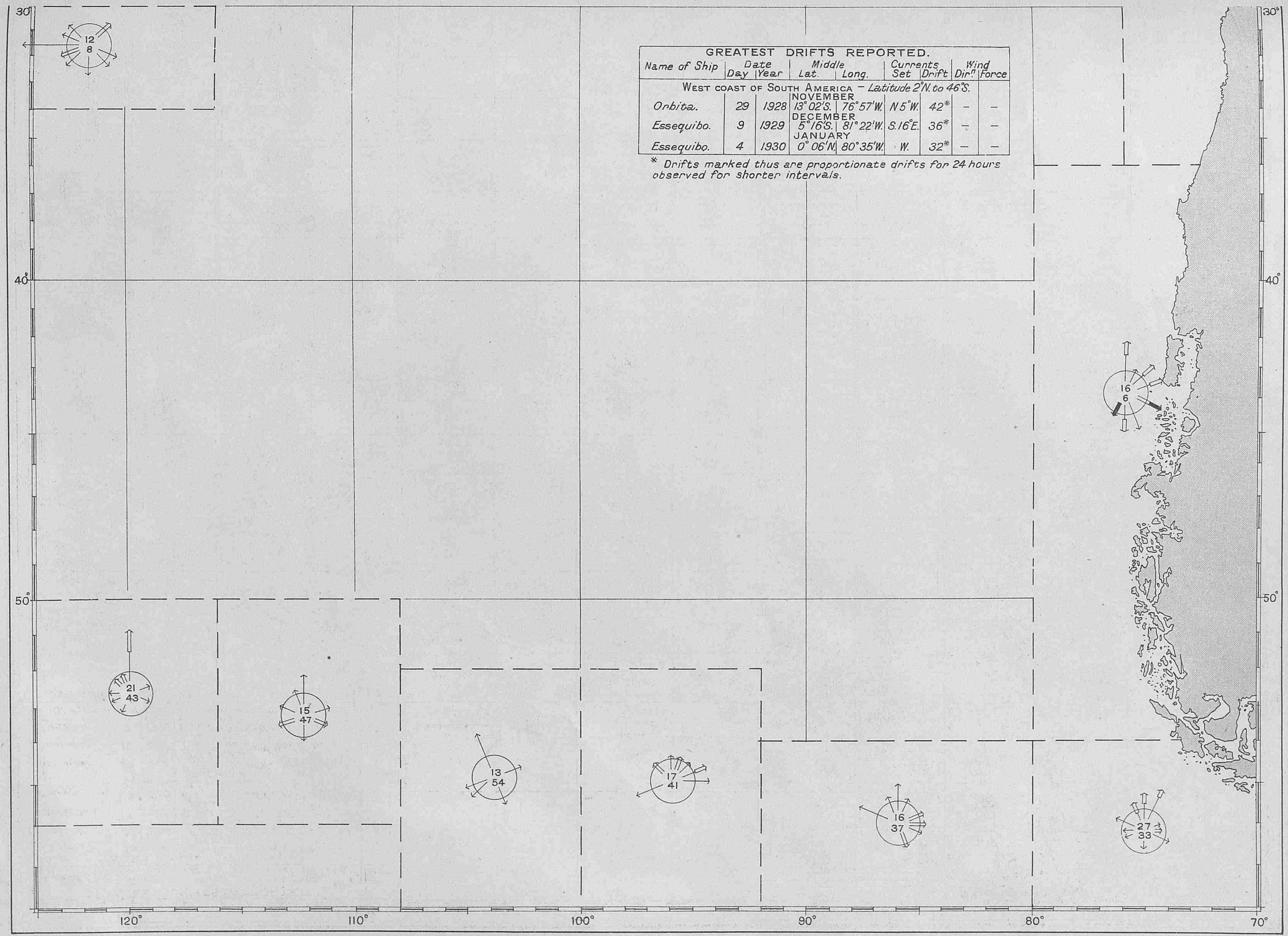
Observations of ships regularly observing for the British Meteorological Office, 1910-1936.


120°
110°
100°
90°
80°
70°
0°
10°
20°
30°
23 0
63 8
235 9
56 11
423 13
14 29
43 7
53 4
77 4
253 8
254 7
55 7
72 13
31 7
54 15
285 22
284 25
45 11
233 20
45 16
67 31
307 30
35 23
310 28
152 33
50 24
108 29
39 39
23 13

GREATEST DRIFTS REPORTED.

Name of Ship	Date Day	Date Year	Middle Lat.	Middle Long.	Currents Set	Currents Drift	Wind Dir.ⁿ	Wind Force
	ROUTE PANAMA TO AUSTRALASIA. Panama Bay to 2°N. eastward of 92°W.							
			NOVEMBER					
Deebank	6	1934	7° 17'.N.	80° 03'.W.	S.30°W.	42*	NW/W	3.
			DECEMBER					
Laomedon	17	1925	8° 07'.N.	79° 38'.W.	S.3°W.	38*	–	–
			JANUARY					
Maimoa	27	1930	6° 20'.N.	80° 44'.W.	S.75°W.	62*	NNE	2.
	Equatorial Current west of 84°W.							
			NOVEMBER					
Rotorua	20	1931	1° 05'.N	100° 08'.W.	S.76°W.	52*	S	2.
			DECEMBER					
Ruapehu	16	1927	0° 31'.S.	85° 28'.W.	N.52°W.	50*	S	4.
			JANUARY					
Port Pirie	2	1929	0° 04'.S.	87° 52'.W.	S.14°W.	51	SbyE	3.

* Drifts marked thus are proportionate drifts for 24 hours observed for shorter intervals.



GREATEST DRIFTS REPORTED.

Name of Ship	Date Day	Date Year	Middle Lat.	Middle Long.	Currents Set	Currents Drift	Wind Dir.ⁿ	Wind Force
West coast of South America – Latitude 2°N. to 46°S.								
			NOVEMBER					
Orbita.	29	1928	13° 02'S.	76° 57'W.	N 5° W.	42*	–	–
			DECEMBER					
Essequibo.	9	1929	5° 16'S.	81° 22'W.	S. 16° E.	36*	–	–
			JANUARY					
Essequibo.	4	1930	0° 06'N.	80° 35'W.	W.	32*	–	–

* Drifts marked thus are proportionate drifts for 24 hours observed for shorter intervals.

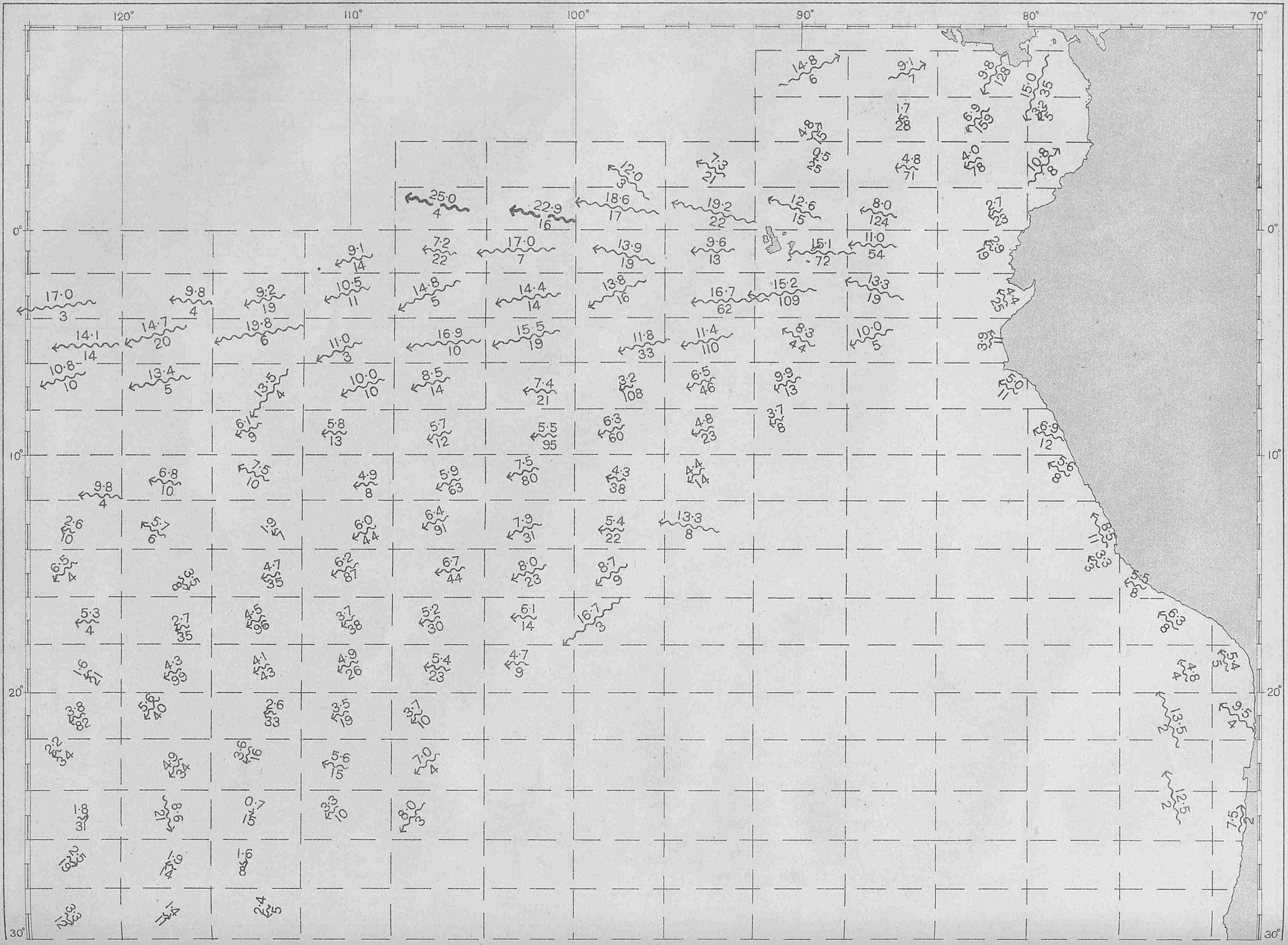
EXPLANATION OF CURRENT ROSES.

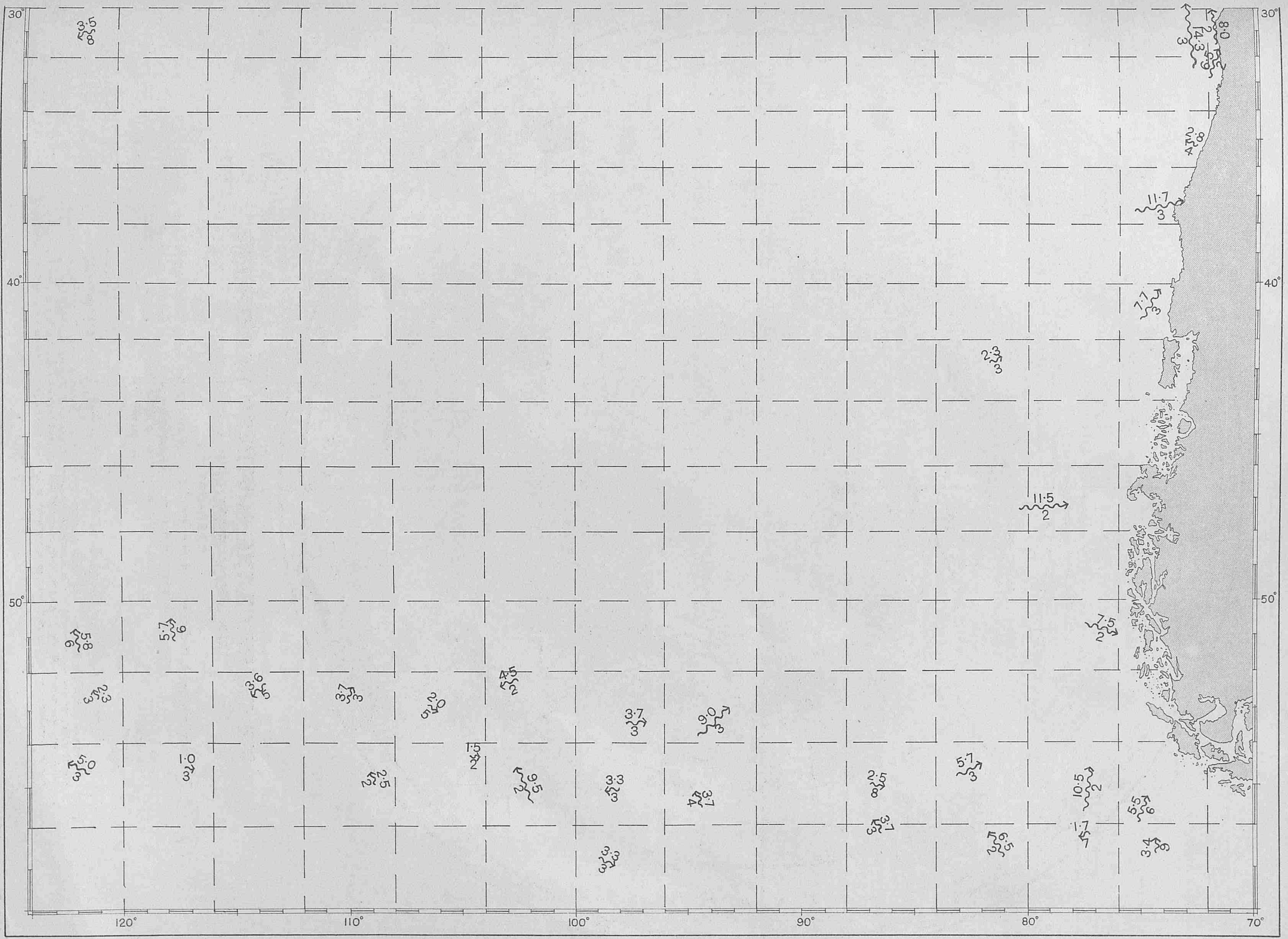
The current roses are drawn from observations within the pecked lines. Arrows flow with the current, length represents frequency, thickness strength,– 6-12 miles per day, ⟶, 13-24 miles per day ⟹,
Distance from tail of arrow to circle represents 5%. Scale 0 10 20 30 40 50%. 25-48 " " ", ➡, 49-72 " " " ⟹,
The upper figure in centre of rose gives total number of observations, the lower figure the percentage frequency of currents less than 6 miles per day. 73 miles per day and above ➡.

CURRENTS IN THE EASTERN PORTION OF THE SOUTH PACIFIC.

NOVEMBER DECEMBER and JANUARY.

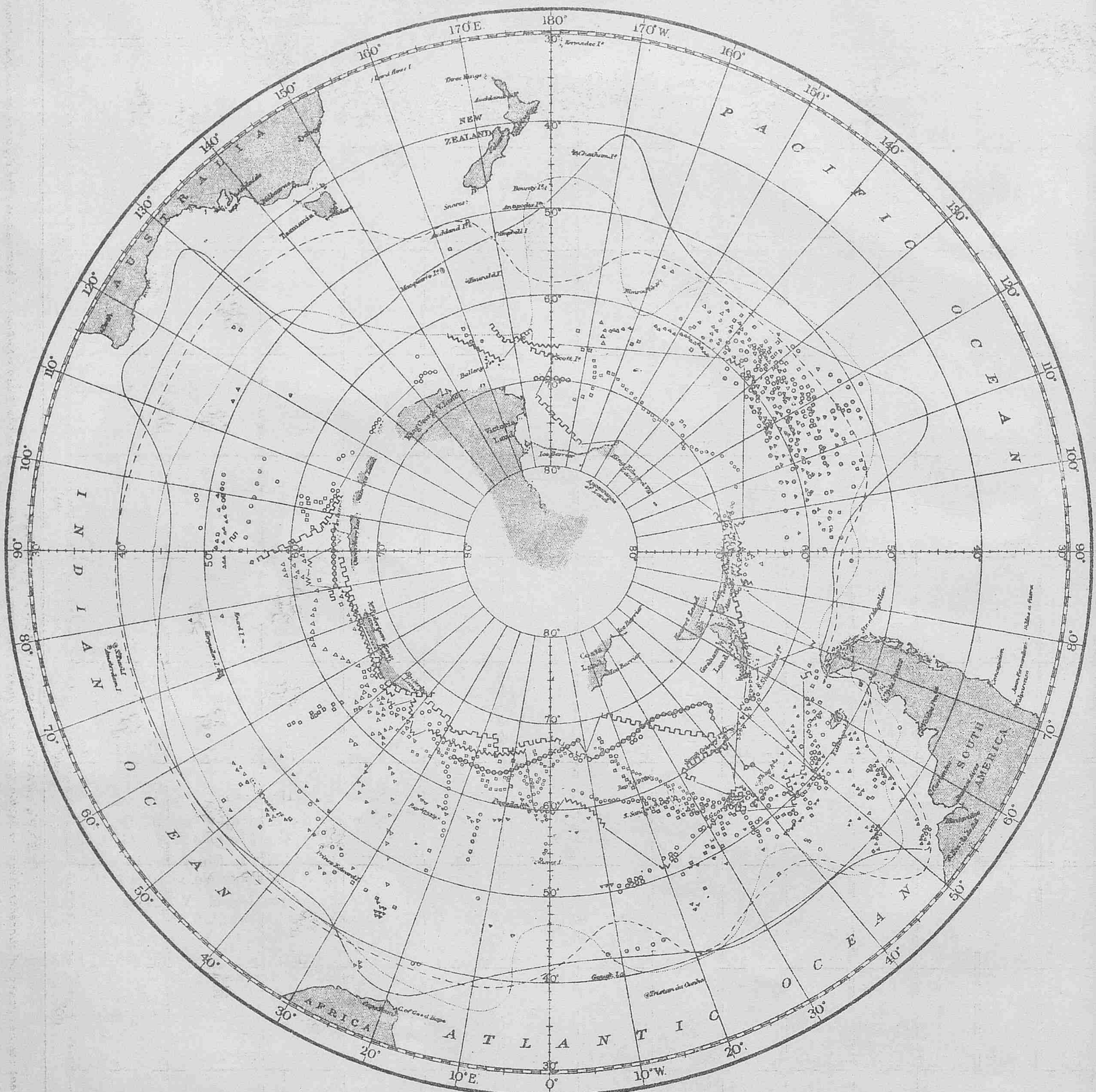
Observations of ships regularly observing for the British Meteorological Office, 1910-1936.


120°
110°
100°
90°
80°
70°
0°
10°
20°
30°


30°
40°
50°
120°
110°
100°
90°
80°
70°
3·5
8
8·0
4·3
2
3
9
2·8
4
11·7
3
7·1
3
2·3
3
11·5
2
7·5
2
5·8
6
5·7
6
2·3
3
3·6
5
3·7
3
2·0
5
4·5
2
3·7
3
9·0
3
5·0
3
1·0
3
2·5
2
1·5
2
9·5
2
3·3
3
3·7
4
2·5
8
3·7
3
5·7
3
6·5
2
10·5
2
1·7
5·5
6
3·4
6
3·3
3

EXPLANATION OF CURRENT ARROWS.

The arrows flow with the current and represent the resultant of currents observed within the pecked lines. The centre of each arrow lies in the mean position of observation. The figures above the arrows give the velocity of current in miles per day; the figures below the arrows the number of observations. In cases where the arrows drawn to scale are inconveniently long the symbol ⇝ *is substituted.*


180°
170°E.
170°W.
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
60°
50°
40°
30°
20°
10°E.
10°W.
0°
P A C I F I C   O C E A N
I N D I A N   O C E A N
A T L A N T I C   O C E A N
A U S T R A L I A
Tasmania
NEW ZEALAND
Kermadec Is.
Lord Howe I.
Three Kings
Auckland
Chatham I.
Bounty Is.
Snares
Antipodes Is.
Auckland Is.
Campbell I.
Macquarie I.
Emerald I.
Scott I.
Balleny Is.
Victoria Land
Ice Barrier
King Edward VII Land
Coats Land
Graham Land
S. Shetland Is.
S. Orkney Is.
S. Georgia
S. Sandwich Is.
Bouvet I.
Falkland Is.
Staten I.
Straits of Magellan
SOUTH AMERICA
Gough I.
Tristan da Cunha
AFRICA
C. of Good Hope
Capetown
Prince Edward Is.
Crozet Is.
Kerguelen I.
Heard I.
St. Paul I.
Amsterdam I.
Enderby Land
Kemp Land
Wilhelm II Land
Queen Mary Land
Knox Land
Wilkes Land
Adelie Land
King George V Land
80°
70°
60°
50°
40°

ICE CHART OF THE SOUTHERN HEMISPHERE,

JANUARY, FEBRUARY and MARCH.

EXPLANATION.

The symbols used to distinguish the ice of each of the three months are as follows:-

	Bergs, 1902-1936.	Position of northernmost pack ice actually observed 1885-1936.	Extreme limit of all ice, 1772-1936.
January.	△	∿∿∿∿∿∿∿∿∿∿∿	————————
February.	□	⊓⊓⊓⊓⊓⊓⊓⊓⊓⊓⊓	– – – – – – – –
March.	○	-o-o-o-o-o-o-o-o-	··················

Note — The symbols for pack ice are joined by hair line where desirable.

The coast line of the Antarctic continent as shown on this chart is not completely corrected to accord with the latest survey information. It is intended in a later volume of The Marine Observer, after the Admiralty Ice chart of the Southern Hemisphere No. 1241 has been revised, to again publish this chart in The Marine Observer with coast lines as complete as possible and to bring the ice information up to date annually.

H.M. Stationery Office Press, Kingsway, W.C.2.

Ps.578/3178. Wt. 18A. 0.22. Gp.908. 1275. 12/36.

MARINE METEOROLOGY.

Co-operation of Shipowners, Masters and Mates.

Captains and Officers of ships registered in Great Britain and Northern Ireland, who wish to co-operate regularly with the Meteorological Office should apply to the appropriate Port Meteorological Officer or Agent, a list of whom, with addresses, is given below.

In accordance with the International Convention for Safety of Life at Sea, the Meteorological Office arranges for certain "Selected Ships" to take meteorological observations at specified hours, and to transmit such observations by wireless telegraphy, for the benefit of other ships and the various meteorological services.

Arrangements are also made for a limited number of ships to keep meteorological logs in certain trades for the purpose of completing the meteorological survey of the oceans.

Ships regularly performing these voluntary duties are known as Observing Ships; the whole as the Voluntary Observing Fleet; and the commanders and officers of these ships as the Corps of Voluntary Marine Observers.

At present the observing fleet is limited to a number not exceeding 360 observing ships. The number of British "Selected Ships" is determined upon the British proportion of world tonnage, on the assumption that there should be a total of 1,000 "Selected Ships" of all nations.

The observing fleet list indicating which are "Selected Ships," with the names of commanders, officers, and other particulars, is published in THE MARINE OBSERVER and kept up to date monthly.

The Organization of Voluntary Meteorological Observation at sea is described in Chapter VII of THE MARINE OBSERVER'S HANDBOOK, sixth edition, now in the press.

THE QUARTERLY MARINE OBSERVER or MONTHLY SUPPLEMENT is sent regularly to the captain of every observing ship, for the information and guidance of his observing officers, and in the case of "Selected Ships," the wireless operators also. The Captains of observing ships are also supplied on request with charts, and atlases, according to trade, if available, as meteorological equipment.

To ensure the accuracy of data collected for the purpose of research and for weather forcasting, ashore and afloat, and to provide a pattern which may be copied with advantage to all concerned for general use in merchant ships, sufficient tested instruments are lent by the Meteorological Office to the Captains of observing ships.

The commanders of observing ships keeping the meteorological log are requested to return it (accompanied by Form 138 in the case of "Selected Ships") through the appropriate Port Meteorological Officer or Agent at intervals of not more than five months.

Commanders of observing ships keeping Forms 911 are requested to return them (accompanied by Form 138 in the case of "Selected Ships") by post direct to the Meteorological Office, London, at the end of each voyage, or at intervals of not more than two months.

These forms have the address and "On His Majesty's Service" printed upon them, and should be folded for posting accordingly.

The Port Meteorological Officers and Merchant Navy Agents inspect official instruments in Meteorological log ships half-yearly, and in "Selected Ships" quarterly, when possible; and they will replace defective gear. These officers will also check the accuracy of barometers in observing ships, but marine observers should themselves frequently check by comparison.

The work of the British observing fleet, that of the observing fleets of other nations party to the Convention for Safety of Life at Sea, together with Weather Shipping Bulletins and Gale and Hurricane Warnings conforming to the International Convention for Safety of Life at Sea, provide the necessary information for shipping. Thus a world wide service for all shipping, at the minimum cost to national funds, is provided. Shipowners are asked to facilitate this voluntary work which is done by the commanders and officers of their ships.

Shipowners will greatly assist by facilitating the forwarding of postal matter from the Air Ministry addressed to the Captains of ships.

The masters of all British ships fitted with wireless telegraphy are asked to assist in this service in aid of navigation by making routine wireless weather reports in accordance with the Selected Ship scheme where and when there are not Selected Ships carrying out the service. As far as possible the Merchant Navy Agents will visit British foreign going ships registered in Great Britain and Northern Ireland, and give assistance and advice if desired.

This supplementary service to that of Selected Ships is particularly desirable in the regions and seasons of tropical revolving storms, and at present on the more northern routes across the North Atlantic and in far northern waters.

A pamphlet entitled "Decode for use with the International Code for Wireless Weather Messages from Ships", M.O. 329, Fourth Edition, can be obtained from H.M. Stationery Office. This gives a description of the world wide system of voluntary Selected Ships routine wireless weather telegraphy, the Tables for decoding reports received from Selected Ships, and notes for the guidance of the masters of British ships.

"A Handbook of Weather, Currents and Ice for Seamen" published by H.M. Stationery Office, may be obtained from the Stationery Office or through any bookseller, price 4s. This provides information of the elements named, the Laws of Storms, and gives guidance for weather forecasting at sea. It also gives some information of Ocean Pilotage and is intended as a guide for making use of the services specified in Article 35 of the Convention for Safety of Life at Sea.

NAUTICAL OFFICERS AND AGENTS OF THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE. AIR MINISTRY.

LONDON ...	Captain L. A. BROOKE SMITH, R.D., R.N.R., Marine Superintendent. Commander J. HENNESSY, R.D., R.N.R., Senior Nautical Assistant. Room 117A, Adastral House, Kingsway, W.C.2. (*Telephone No.: Holborn 3434 Extension 421*). Nearest station, Temple, District Railway.
THAMES ...	Commander C. H. WILLIAMS, R.N.R., Port Meteorological Officer, P.L.A. Building, King George V Dock (south side), London, E.16. (*Telephone No.: Albert Dock 2659. Telegraphic Address: Barometric Aldock, London*).
MERSEY ...	Commander M. CRESSWELL, R.N.R., Port Meteorological Officer, Dock Office, Liverpool. (*Telephone No.: Bank 8959. Telegraphic Address: Meteorite, Liverpool*).

Agents.

BRISTOL CHANNEL	Captain EDWARD HALL, 21, Dowlais Buildings, West Bute Street, Cardiff. (*Telephone No.: Cardiff 1268*).

Agents (*contd.*).

CLYDE ...	Captain W. HENDERSON, 80, Buchanan Street, Glasgow, C.1. (*Telephone No. Central 3775*).
FORTH ...	Captain G. MORE, Chief Dock Master's Office. Leith. (*Telephone No.: Leith 36262*).
HONG KONG, China.	Lieut. Commander M. V. KEOGH, R.N., Chart Depot, H.M. Dockyard. (*Telephone No.: 108 Dockyard*).
HUMBER ...	W. H. CARR, Esq., Master Mariner, Farensway Chambers, Farensway, Hull. (*Telephone No.: Hull 16063.*)
SOUTHAMPTON	Captain Sir BENJAMIN CHAVE, K.B.E. Room 35 Royal Mail House.
SYDNEY, New South Wales.	Captain N. G. ROSKRUGE. Captain G. B. MERCER. Customs House. (*Telephone No.: B6421*).
TYNE ...	Captain F. B. WEST, Customs House Chambers, Quayside, Newcastle upon Tyne, 1. (*Telephone No.: Newcastle 23203*).

DERELICTS AND FLOATING WRECKAGE.

Date.	Position		Description
	Latitude.	Longitude.	
IRISH SEA.			
3.12.36	1½ miles N. of Point of Ayre		Ship's lifeboat, just awash.
ENGLISH CHANNEL.			
5.12.36	49°37′N.	3°18′W.	Small boat, awash.
English Channel—(*cont.*)			
15.12.36	50°35′N.	0°11′E.	Black conical buoy with staff, but no flag, adrift.
16.12.36	50°15′N.	2°59′W.	Two red second class nun-buoys adrift, dangerous to navigation

CHART OF THE WESTERN NORTH ATLANTIC.

Showing the North Atlantic Lane Routes in force during JANUARY as laid down by the Trans-Atlantic Track Convention. If at any time, owing to abnormal ice conditions, any alteration to the usual tracks is considered advisable by the track convention, particulars will be published on this chart. For full information concerning the North Atlantic Lane Routes see pages 60 and 61 of the April, 1936 number.

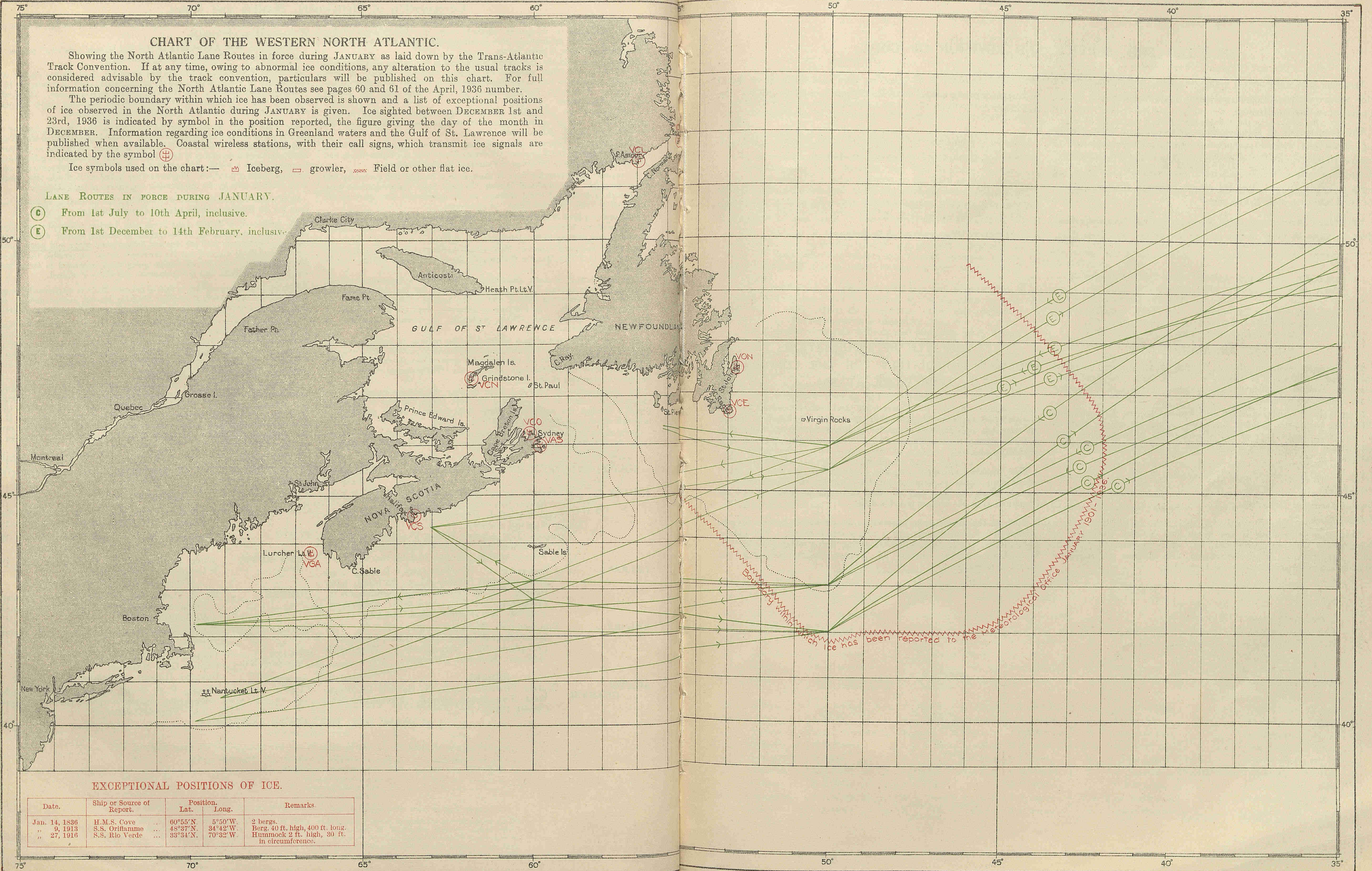
The periodic boundary within which ice has been observed is shown and a list of exceptional positions of ice observed in the North Atlantic during JANUARY is given. Ice sighted between DECEMBER 1st and 23rd, 1936 is indicated by symbol in the position reported, the figure giving the day of the month in DECEMBER. Information regarding ice conditions in Greenland waters and the Gulf of St. Lawrence will be published when available. Coastal wireless stations, with their call signs, which transmit ice signals are indicated by the symbol ⊕

Ice symbols used on the chart:— ♔ Iceberg, ▭ growler, ﹏ Field or other flat ice.

LANE ROUTES IN FORCE DURING JANUARY.

Ⓒ From 1st July to 10th April, inclusive.

Ⓔ From 1st December to 14th February, inclusive.


75°
70°
65°
60°
55°
50°
45°
40°
35°
50°
45°
40°
Clarke City
Anticosti
Heath Pt. Lt.V.
Fame Pt.
Father Pt.
GULF OF ST LAWRENCE
NEWFOUNDLAND
P. Amour
VCL
C. Norman
C. Ray
VON
VCE
St. Pierre
C. St. Mary
Virgin Rocks
Magdalen Is.
Grindstone I.
VCN
St. Paul
Prince Edward Is.
Cape Breton I.
VCO
Sydney
VAS
Quebec
Grosse I.
Montreal
St. John
NOVA SCOTIA
Halifax
VCS
Sable Is.
Lurcher Lt. V.
VGA
C. Sable
Boston
New York
Nantucket Lt. V.
E
C
Boundary within which Ice has been reported to the Meteorological Office JANUARY 1901–1936.

EXCEPTIONAL POSITIONS OF ICE.

Date.	Ship or Source of Report.	Position. Lat.	Position. Long.	Remarks.
Jan. 14, 1836	H.M.S. Cove ..	60°55′N.	5°50′W.	2 bergs.
" 9, 1913	S.S. Oriflamme ...	48°37′N.	34°42′W.	Berg. 40 ft. high, 400 ft. long.
" 27, 1916	S.S. Rio Verde ...	33°34′N.	70°32′W.	Hummock 2 ft. high, 30 ft. in circumference.

H M Stationery Office Press, Kingsway. W.C.2.

Ps.578/3178. Wt.18 A.D.22. Gp.908. 375. 12/36.

NOTICES TO MARINE OBSERVERS.

SELECTED SHIP SERVICE AND REVISION OF CODE.

Particular attention is invited to the revised description of the Selected Ship Scheme with instructions published on pages 36 to 47 in this number of the Marine Observer.

Will Commanders of Selected Ships please request their observing officers and wireless operators to carefully observe the lists of wireless stations detailed to receive reports from A and B Selected Ships which have been overhauled, amended and extended and which are being copied in Volume II of the Admiralty List of Wireless Stations, for the information of all British ships.

The revised International Ships Wireless Weather Telegraphy Code given on pages 44 to 47 in this number and on the New Code Card, form 138A, circulated to all observing ships with this number, should be brought into use on January 1st, 1937, or as soon as possible after that date.

It should be particularly noted that in the "Past Weather," Table VII, the meanings of numbers 3 to 8 have been changed.

The 4th Edition of the Pamphlet, M.O. 329, containing the Decode and general description of the Selected Ship System with instructions for the guidance of British ships, revised to date, may be obtained at H.M. Stationery Office, or through booksellers.

POSTAL ARRANGEMENTS.

The quarterly numbers of the Marine Observer are published on the last Wednesdays of December, March, June and September, while the monthly supplements are published on the last Wednesday of the intervening months.

If captains of observing ships will forward to the Meteorological Office the particulars required hereunder, endeavour will be made as far as mails permit to post the latest number or supplement with appropriate forms for observational work for use on their homeward passage.

S.S.................................... *Captain*..

Port of Call..

Date of Homeward Departure..

Postal Address..

When this information is not given The Marine Observer or Supplement will be addressed to the Commanding Officer, s.s.........................., c/o the owners, and captains are requested to make their own arrangements for forwarding.

DESPATCH OF INFORMATION REQUIRED IMMEDIATELY FOR THE CONDUCT OF THE WORK AT SEA.

Shipowners, Marine Superintendents and all concerned in the despatch of mails to Ships abroad are asked to kindly facilitate the despatch and delivery of postal matter received at their offices from the Meteorological Office and Air Ministry Publication Depot to their Ships abroad.

This matter addressed to the Commanders of Ships contains information which is required for the Conduct of Marine Meteorological Work at Sea and is most effective if received by the Commanders at the earliest possible date.

Much of the information referred to is published in the Marine Observer and Supplements, and is of a seasonal nature. This journal also contains advice to Regular Observing Ships which enables them to perform voluntary service by Wireless Communication for the benefit of all shipping.

FLEET LIST.

VOLUNTARY OBSERVING SHIPS.

The following is a complete list of British observing ships regularly carrying out voluntary services of marine meteorology with the guidance of the Marine Division of the Meteorological Office.

The names of the Captains and observing officers of observing ships, and the Senior Wireless Operators of Selected Ships are given, as ascertained from the last written return received.

Meteorological Logs, Records, and W/T Weather Registers received between the dates specified at the head of the seventh column are acknowledged by Form number, with commencing and ending dates of period covered by the returns; the date when the last return was received being given in the eighth column.

The Captains of observing ships are requested to take this acknowledgment in cordial thanks and grateful recognition to them and their observing officers and wireless operators for the returns made and the voluntary service rendered in all parts of the world.

The classification of meteorological logs and Selected Ships' records and registers will be notified to the Captains by post card Form 1343. Only in exceptional cases will individual letters be sent to the Captains of observing ships.

The Port Meteorological Officers and Merchant Navy Agents at the ports are advised as necessary, and they will, as necessary, communicate such advice verbally by personal call upon the Captain.

Excellent Awards will be made at the end of the financial year. The names of the Captains and Principal Observing Officers gaining these awards will be published in a special list in the Marine Observer.

It is requested that prior notification of changes of service, probable periods of lay up, transfer of Captains, or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to the appropriate Port Meteorological Officer or Merchant Navy Agent.

Ships not making the appropriate written returns within a reasonable period will be removed from the list, steps taken to recover any instruments lent, and the free issue of the Marine Observer discontinued.

The number of voluntary observing ships is limited to a maximum total of 360.

The number of Selected Ships detailed to carry out the voluntary service provided for in Clause (C) of Article 35 of the Convention for Safety of Life at Sea, Merchant Shipping (Safety and Load Line Conventions) Act, 1932, is determined by the British proportion of the world's tonnage; and is at present 281.

Captains are requested to point out any errors which may occur in the list.

Explanation of Abbreviations.

The number appearing before the name of an observing ship in this list is her number for the time being as a British Selected Ship.

†† indicates fitted with wireless telegraphic apparatus for long range, long wave, continuous wave transmission and reception.

*† indicates fitted with wireless telegraphic apparatus for transmission and reception; fitted for reception only of long range, long wave, continuous wave.

M.V. = Motor Vessel.

S.T. = Steam Trawler.

Ships having no such letters after their names are steamships.

M.L. = Equipped with a complete set of tested instruments lent by the Meteorological Office for keeping the meteorological log.

M. = Ships' own mercurial barometer, found to be sufficiently accurate and reliable for the purpose of observation for making wireless weather reports.

S. = Partly or wholly equipped with tested instruments lent by the Meteorological Office for the purpose of carrying out the duties of a Selected Ship, when detailed to do so.

A. = Ships' own aneroid.

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.		Date Last Return Received.
275 †† *Abosso*, M.V. ...	J. C. Shooter	R. A. Kenyon, P. D. Jones, E. D. Ashford.	G. Arrowsmith	M.-S.	Elder Dempster Lines, Ld.	Fms. 911 & 138	10.9.36 to 15.10.36	22.10.36
122 †† *Accra*, M.V. ...	P. Sola, D.S.O., Lt.-Commr., R.N.R. ...	W. Dunn, W. T. Godwin,	R. J. Dowling ...	,,	,, ,,	,, ,,	27.8.36 to 22.11.36	1.12.36
123 †† *Adda*, M.V. ...	E. V. Davies, D.S.O. ...	C. W. Nimmo, T. G. Bentley.	A. J. L. Edwards	,,	,, ,, ,,	,, ,,	13.8.36 to 8.11.36	23.11.36
273 *† *Adrastus* ...	A. F. Gow A. Shaw	D. W. Lambton, J. S. Ogilvie, W. J. Eynon.	H. L. Wood ...	M.L.	A. Holt & Co. ...	Fm. 915	6.4.36 to 23.7.36	9.9.36
090 *† *Aeneas*	J. Hatfield	A. J. Hume, G. Edge, J. H. K. Griffin.	H. G. Nuttall ...	S.	,, ,, ...	Fms. 911 & 138	14.7.36 to 28.10.36	3.11.36
166 *† *Agamemnon*, M.V.	J. G. Reynard	L. Richards, T. Bell, E. B. Sandon.	A. C. Nevin ...	,,	,, ,, ...	,, ,,	27.7.36 to 9.11.36	18.11.36
065 †† *Akaroa*	W. G. Summers ...	J. D. Morrison, W. Hill, A. M. Whiteford.	J. A. McAskill	,,	Shaw, Savill & Albion Co., Ld.	,, ,,	14 .6.36 to 16.9.36	6 10.36
032 †† *Alaunia*... ...	P. R. Vaughan, D.S.C., R.D., Commr., R.N.R.	A. H. Young, A. G. Cuthill, A. Mackellar.	A. F. Porter ...	,,	Cunard White Star, Ld.	,, ,,	24.8.36 to 6.11.36	11.11.36
129 †† *Alcantara* ...	B. Shillitoe, R.D., Commr., R.N.R.	W. Williams, F. J. Swallow, W. D. Fraser.	C. F. McCarthy	M.-S.	Royal Mail Lines, Ld.	,, ,,	11.8.36 to 7.11.36	11.11.36
178 *† *Alipore*	L. Parfitt	E. F. Ferraby, H. T. Rigden, J. S. G. Christian.	A. G. Hastings...	M.	P. & O. S.N. Co.	,, ,,	1.8.36 to 6.10.36	26.10.36
175 †† *Almanzora* ...	T. J. C. Buret, D.S.C....	T. Davies, E. N. Gilles, S. T. Whiteside.	J. Caldwell ...	S.	Royal Mail Lines, Ld.	,, ,,	24.8.36 to 5.10.36	8.10.36
086 †† *Almeda Star* ...	H. C. Howard	J. H. A. Mackie, R. Robson, F. A. J. Andrew.	R. N. Austin ...	M.-S.	Blue Star Line, Ld.	,, ,,	5.9.36 to 29.10.36	3.11.36
022 *† *Alynbank*, M.V.	D. Gillies	A. C. Glover, J. W. Jackson, E. P. Stephens.	P. T. Brown ...	S.	A. Weir & Co. ...	Fm. 915	2.9.36 to 27.9.36	27.10.36
160 *† *Amarapoora* ...	J. F. Burke	R. Treasurer, J. Grant, W. D. Tullock.	A. M. Douglas...	,,	P. Henderson & Co.	Fms. 911 & 138	7.9.36 to 18.11.36	24.11.36
*† *Amsterdam* ...	B. M. Stone	R. H. Wright	D. T. Wright ...	,,	L. & N. E. Rly....	,, ,,	1.9.36 to 28.11.36	3.12.36
006 †† *Andalucia Star*	R. V. Round	G. E. Barnard, W. A. G. Curphey, G. Brunton.	R. V. Gregory ...	M.-S.	Blue Star Line, Ld.	,, ,,	24.8.36 to 14.10.36	20.10.36
*† *Andania* ...	F. J. Burd	R. V. Youd, D. S. Kite, A. Thompson,	R. F. Watson ...	S,	Cunard White Star, Ld,	,, ,, Fm 912	13.9.36 to 28.11.36 13 9 36 to 28.11.36	3.12.36 3.12.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received.
*† *Anselm*	F. C. P. Harris ...	L. A. Sayers	... ...	S.	Booth S.S. Co., Ld.	Fm. 911 5.9.36 to 21.10.36	3.11.36
259 *† *Antonia* ...	W. S. Quinn	J. Law, J. Chapman, J. C. Boyce.	C. G. Wood ...	,,	Cunard White Star Ld.	Fms. 911 & 138 30.8.36 to 13.11.36 Fm. 912 30.8.36 to 13.11.36	18.11.36 18.11.36
209 †† *Aorangi*, M.V. ...	T. V. Hill	H. J. P. Weston, W. Broughton, T. Germein.	C. F. G. Taylor	M.L.	Canadian-Australasian Line, Ld.	Fm. 915 23.4.36 to 8.8.36	15.10.36
120 †† *Apapa*, M.V. ...	J. H. Lawson	C. V. Evans, L. Collings ...	J. Rea	M.-S.	Elder Dempster Lines, Ld.	Fms. 911 & 138 24.9.36 to 31.10.36	3.11.36
017 †† *Aquitania* ...	R. B. Irving, O.B.E., R.D., Capt., R.N.R.	E. A. Divers, E. Gleave, J. H. Walker.	J. N. Cragg ...	S.	Cunard White Star, Ld.	,, ,, 10.9.36 to 16.11.36	23.11.36
115 †† *Arandora Star* ...	E. W. Moulton ...	G. C. Case, F. Macquiston, R. L. Leech.	J. T. Williams ...	M.-S.	Blue Star Line, Ld.	,, ,, 6.9.36 to 20.11.36	24.11.36
114 *† *Ariguani* ...	R. A. Thorburn, R.D., Commr., R.N.R.	C. K. Harrocks, F. Dudgeon, G. McKee.	B. M. Evans ...	S.	Elders & Fyffes, Ld.	,, ,, 2.9.36 to 8.11.36	18.11.36
039 †† *Arlanza*	A. Cocks, D.S.C., R.D., Capt., R.N.R.	M. J. Morton, A. Nicholls, F. Thacker.	G. Hunt ...	,,	Royal Mail Lines, Ld.	,, ,, 23.9.36 to 31.10.36	9.11.36
095 †† *Arundel Castle* ...	C. Le Brocq	R. F. Balchin, W. S. Allen ...	... ...	,,	Union-Castle Mail S.S. Co. Ld.	,, ,, 19.9.36 to 8.11.36	11.11.36
233 †† *Ascania* ...	J. G. P. Bisset, R.D., Commr., R.N.R.	J. H. Kenworthy, B. O'Brien, P. L. Williams.	J. W. Haynes ...	,,	Cunard White Star, Ld.	,, ,, 31.8.36 to 13.11.36	18.11.36
280 *† *Astronomer* ...	J. Richards	C. Boam, E. Pierce, D. Woolstenholme.	H. Wilson ...	M.	T. & J. Harrison ...	,, ,, 13.12.35 to 20.4.36	27.4.36
013 †† *Asturias* ...	A. Purvis	H. E. Sang, B. Gammond, J. C. Smyth.	T. Bradfield ...	S.	Royal Mail Lines, Ld.	,, ,, 9.9.36 to 9.10.36	13.10.36
091 †† *Athenia*	W. Rennie	J. Blackwood, L. T. Napier, J. R. Henderson.	D. Don ...	,,	Donaldson Atlantic Line.	,, ,, 7.9.36 to 21.11.36	27.11.36
028 †† *Athlone Castle*, M.V.	A. Barron	J. M. Croghan, G. Pickering, E. Tamlyn.	H. Oliver ...	,,	Union-Castle Mail S.S. Co., Ld.	,, ,, 25.7.36 to 11.11.36	23.11.36
†† *Atlantis*	F. R. Miles, R.D., Capt. R.N.R.	L. T. Peterson	... ...	M-S.	Royal Mail Lines, Ld.	... ...	...
240 *† *Aurania* ...	S. E. Stubbs, O.B.E., R.D., Commr., R.N.R.	H. Morgan, H. L. Pryse, G. Morris.	E. P. Bishop ...	,,	Cunard White Star, Ld.	Fms. 911 & 138 7.9.36 to 20.11.36	24.11.36
103 *† *Ausonia* ...	W. C. Battle, D.S.C., R.D., Capt., R.N.R.	C. B. Osborne, J. W. Caunce, J. P. V. Evans.	T. F. Wyatt ...	,,	,, ,,	,, ,, 13.9.36 to 28.11.36 Fm. 912 13.9.36 to 28.11.36	3.12.36 3.12.36
046 *† *Australia Star*, M.V.	T. Williams	J. Davis, J. W. Thompson, M. B. M. Lallack.	J. St. C. Smart	M.	Blue Star Line, Ld.	Fms. 911 & 138 6.8.36 to 3.11.36	18.11.36
133 †† *Avelona Star* ...	G. E. Hopper	F. W. Brown, P. A. Clark, S. H. Waters.	S. J. J. Scott ...	M.-S.	,, ,,	,, ,, 21.9.36 to 9.11.36	18.11.36
045 †† *Avila Star* ...	R. J. Thomas	S. Ranson, C. C. Howard, J. Y. Gallienne.	H. Varley ...	,,	,, ,,	,, ,, 26.7.36 to 20.11.36	27.11.36
068 †† *Balmoral Castle*	W. Weller	J. F. Trickey	J. Summers ...	S.	Union-Castle Mail S.S. Co., Ld.	,, ,, 29.8.36 to 18.10.36	22.10.36
248 *† *Banffshire* ...	A. W. P. Gibb ...	M. E. Murphy, A. G. Storkey, F. H. Petherbridge.	K. N. Lane ...	M.	Turnbull, Martin & Co., Ld.	,, ,, 16.12.35 to 3.5.36	20.5.36
037 *† *Baronesa* ...	R. W. Compton ...	J. R. Faulkner, F. W. Kent, S. W. Howell.	M. Doran ...	,,	Furness Lines, Ld.	,, ,, 8.9.36 to 11.11.36	18.11.36
180 *† *Beaverbrae* ...	E. Jones	P. Locke, D. Morrison, A. Tipper.	W. Kinninmouth	,,	Canadian Pacific Steamships, Ld.	,, ,, 12.9.36 to 7.11.36	18.11.36
130 *† *Beaverburn* ...	A. H. Hall	A. J. Mackenzie	S. J. Taylor ...	,,	,, ,,	,, ,, 22.8.36 to 22.11.36	27.11.36
*† *Beaverdale* ...	H. G. Ferguson, D.S.C.	J. B. Saunders, G. H. Coughlan, F. H. Stell.	J. Ormiston ...	,,	,, ,,	,, ,, 19.9.36 to 14.11.36 Fm. 912 19.9.36 to 14.11.36	18.11.36 18.11.36
279 *† *Beaverford* ...	D. Robertson	E. Aikman, B. Ford, B. R. Russell.	J. J. Fraser ...	,,	,, ,,	Fms. 911 & 138 3.9.36 to 31.10.36 Fm. 912 3.9.36 to 31.10.36	9.11.36 9.11.36
069 †† *Berengaria* ...	J. C. Townley, R.D., Capt., R.N.R.	... ...	... ...	S.	Cunard White Star, Ld.	... ...	...
145 *† *Berwickshire* ...	J. D. Matthews ...	R. A. Harris, D. W. Muir, N. C. McCallagh.	W. Smale ...	,,	Turnbull, Martin & Co., Ld.	Fms. 911 & 138 2.9.36 to 6.10.36	12.10.36
007 *† *Bradfyne* ...	M. O'Neill	H. F. Thomas, P. Evans, J. Robertson.	A. Shaw ...	,,	Sir Wm. Reardon Smith & Partners, Ld.	,, ,, 23.3.36 to 26.8.36	1.9.36
*† *Brighton* ...	W. Lidbetter	E. Balcombe, E. W. Scurth...	A. Jones ...	,,	Southern Rly. ...	,, ,, 1.9.36 to 31.10.36	3.11.36
189 †† *Britannic* ...	A. T. Brown, R.D., Capt. R.N.R.	L. A. F. Kingscote	... ...	,,	Cunard White Star, Ld.	... ...	...
269 *† *British Admiral*	J. H. Stockman ...	J. D. Johnston, C. W. Gough	R. D. Dingley ...	M.	British Tanker Co., Ld.	Fms. 911 & 138 21.8.36 to 19.11.36	2.12.36
*† *British Colonel*	J. K. W. Kemp ...	D. A. Ponting	... ...	,,	,, ,,	Fm. 911 11.8.36 to 21.11.36	1.12.36
038 *† *British Corporal*	J. H. Sloan	F. S. Hall, D. Lyle, H. H. Burke.	J. Darling ...	,,	,, ,,	Fms. 911 & 138 18.8.36 to 15.11.36	24.11.36
054 *† *British General* ...	A. Scorah	A. D. Miller, P. E. Norton, F. Baker.	F. Winterbottom	,,	,, ,,	,, ,, 29.8.36 to 13.10.36	26.10.36
*† *British Grenadier*	P. V. Mills	J. H. Nelson	... ...	,,	,, ,,	Fm. 911 19.8.36 to 16.10.36	9.11.36
*† *British Hussar* ...	G. F. Turner	F. M. Shipway	... ...	,,	,, ,,	,, 18.9.36 to 24.10.36	3.11.36
*† *British Officer* ...	W. Watkin-Thomas ...	S. Thompson	... ...	,,	,, ,,	,, 11.8.36 to 11.11.36	24.11.36
*† *British Statesman*	J. S. Copplestone ...	C. Spark	... ...	,,	,, ,,	,, 4.7.36 to 6.11.36	1.12.36
*† *British Workman*	C. W. C. Stook ...	W. Forsyth, H. Phillips, L. Jackson.		,,	,, ,,	,, 2.9.36 to 24.10.36	3.11.36
249 *† *Buteshire* ...	C. A. I. Laird	P. McMillan, R. H. Pape, C. F. Cooke.	W. W. Whewell	S.	Turnbull, Martin & Co., Ld.	Fms. 911 & 138 1.1.36 to 23.5.36	24.6.36
031 †† *Caledonia* ...	A. Collie	H. L. P. King, R. Blake, R. M. Brown.	J. F. Reid ...	,,	Anchor Line, Ld.	,, ,, 23.8.36 to 8.11.36 Fm. 912 23.8.36 to 8.11.36	11.11.36 11.11.36
139 †† *California* ...	R. W. Smart	D. G. Barr, J. D. MacKenzie, W. McCabe.	... ...	,,	,, ,,	Fms. 911 & 138 30.8.36 to 29.11.36	3.12.36
*† *Cambria* ...	E. B. Turner	F. G. Manning	J. Pritchard ...	,,	L.M. & S. Rly. ...	,, ,, 19.8.36 to 16.10.36	20.10.36
*† *Cambridge* ...	R. Williams	... ...	... ...	,,	Federal S.N. Co., Ld.	... ...	...
042 †† *Cameronia* ...	W. Gemmell	J. L. Gibson, G. Goodwin, G. Forrest.	J. McDonald ...	,,	Anchor Line, Ld.	Fm. 311 & 138 6.9.36 to 22.11.36 Fm. 912 6.9.36 to 22.11.36	27.11.36 27.11.36
252 *† *Camito*	A. W. Legge, Lt.-Commr., R.N.R.	W. Chanter, J. Cameron ...	R. E. Blizzard ...	,,	Elders & Fyffes, Ld.	Fms. 911 & 138 17.9.36 to 18.10.36	22.10.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received.
117 *† _Cape of Good Hope_ M.V.	A. T. McGlashan	R. J. Carnochan, P. A. Wallace, H. Evans	G. W. Pragnell	S.	Lyle Shipping Co., Ld.	Fms. 911 & 138 7.9.36 to 12.10.36	24.11.36
266 †† _Carinthia_	P. A. Murchie, O.B.E., R.D., Capt., R.N.R.	R. Conway, M. Boston, H. H. Hudson.	J. Harvey	,,	Cunard White Star, Ld.	,, ,, 6.9.36 to 24.10.36 Fm. 912 6.9.36 to 24.10.36	27.10.36 27.10.36
092 †† _Carnarvon Castle,_ M.V.	C. N. Bickford.	J. E. Gibbs, F. Marriot	P. Haslam	,,	Union-Castle Mail S.S. Co., Ld.	Fms. 911 & 138 15.8.36 to 3.10.36	13.10.36
155 †† _Carthage_	H. M. Jack	H. M. Flint, J. L. Dunkley, G. P. Edwards.	F. Rose	M.-S.	P. & O. S.N. Co.	,, ,, 20.6.36 to 16.9.36	23.9.36
184 †† _Cathay_	R. R. Burge	L. H. Howard, D. West, D. W. A. Bell.	H. Dawson	,,	,, ,, ,,	,, ,, 6.9.36 to 14.10.36	26.10.36
*† _Cavina_	W. T. Forrester, O.B.E.	J. D. S. Sloper, J. A. Duff	A. N. Taylor	S.	Elders & Fyffes, Ld.	,, ,, 10.9.36 to 22.11.36	24.11.36
011 †† _Ceramic_	H. C. Elford	G. F. Cresswell, G. Hawley, W. J. Shirtcliffe.	W. Ross	,,	Shaw, Savill & Albion Co., Ld.	Fms. 911 & 138 24.8.36 to 8.10.36 Fm. 912 13.9.36 to 25 9.36	18.11.36 18.11.36
029 *† _Cheshire,_ M.V.	W. L. Foster	H. W. Brammall, C. R. Lovell, J. H. Kaye.	F. W. Greaves	,,	Bibby Bros. & Co.	Fms. 911 & 138 2.8.36 to 7.10.36	12.10.36
191 *† _Chindwin_	G. Paterson	J. S. Whitehead, A. E. Hughes, J. M. Watt.	A. C. Hedley	,,	P. Henderson & Co.	,, ,, 10.8.36 to 19.10.36	26.10.36
067 *† _Chinese Prince,_ M.V.	W. Finch	L. G. Taylor, A. L. Wiles, W. R. M. Hill.	S. R. Stewart	M.L.	Furness Lines Ld.	Fm. 915 20.3.36 to 27.6.36	12.8.36
192 †† _Chitral_	H. Elliott Smith, R.D., Lt.-Commr., R.N.R.	J. C. Langton, J. E. A. Toulouse, C. C. Gardner.	P. R. Rowley	M.-S.	P. & O. S.N. Co.	Fms. 911 & 138 19.7.36 to 17.10.36	3.11.36
051 *† _City of Auckland_	H. G. Jenkins, O.B.E.	J. F. Hodgson	C. A. Wells	S.	Ellerman Lines, Ld.	,, ,, 26.8.36 to 6.10.36	27.10.36
135 *† _City of Barcelona_	W. Hill	R. A. Jones, A. Cran, H. G. Williams.	F. F. Alton	M.	,, ,, ,,	,, ,, 18.9.36 to 16.11.36	23.11.36
265 *† _City of Baroda_	A. V. Radcliffe, R.D., Commr., R.N.R.	W. H. Dalton, R. S. Steel	W. S. Clark	S.	,, ,, ,,	,, ,, 5.9.36 to 29.9.36	12.10.36
057 ††_City of Benares_	A. Lee	... ...	... ...	,,	,, ,, ,,	... ...	... ...
158 *† _City of Cairo_	A. N. Hogg	T. B. Savigny	... ...	M.	,, ,, ,,	Fms. 911 & 138 28.9.36 to 23.10.36	18.11.36
215 *† _City of Canberra_	H. R. Jackson	G. C. Longfield, R. F. Henry, G. D. Davies.	C. Kerridge	,,	,, ,, ,,	,, ,, 26.8.36 to 19.10.36	9.11.36
033 *† _City of Canton_	J. W. Kendall	O. G. Williams, W. E. Fletcher, T. L. Vaughan.	C. A. Morgan	,,	,, ,, ,,	,, ,, 27.7.36 to 1.10.36	3.11.36
157 *† _City of Delhi_	A. Thomson	W. J. Nixon, D. J. Inglis	W. McGilligan	S.	,, ,, ,,	,, ,, 11.6.36 to 25.10.36	3.11.36
030 *† _City of Dieppe_	J. Wyper	A. Travis, J. Muir	J. P. Edmunds	,,	,, ,, ,,	,, ,, 18.7.36 to 15.9.36	26.10.36
049 *† _City of Evansville_	D. O. Evans	G. Owen, A. M. Field, F. P. Monkton.	F. J. Glynn	M.	,, ,, ,,	,, ,, 13.8.36 to 31.10.36	11.11.36
220 †† _City of Exeter_	D. L. Lloyd	J. W. Wotherspoon, W. S. Jackson, J. Findlay.	L. Hugo	S.	,, ,, ,,	,, ,, 1.6.36 to 3.8.36	18.8.36
089 *† _City of Hereford_	W. J. Merchant	J. B. W. Daly, C. W. Cross, D. W. Penberthy.	A. Haslam	M.	,, ,, ,,	,, ,, 20.9.36 to 13.10.36	2.12.36
237 †† _City of London_	J. G. Brown	H. A. Hazeel, C. W. Armstrong, J. H. Merriman	R. Cruickshank	S.	,, ,, ,,	,, ,, 11.10.36 to 5.11.36	2.12.36
256 *† _City of Lyons_	F. W. Penberthy	H. E. Roberts, J. S. Stevenson, R. W. Tyrrell.	S. Lindsay	M.	,, ,, ,,	,, ,, 21.8.36 to 27.10.36	20.11.36
066 †† _City of Nagpur_	N. McNeil, O.B.E.	H. H. Asher, R. F. McDougall	A. E. Dowe	S.	,, ,, ,,	,, ,, 28.4.36 to 3.9.36	8.9.36
074 †† _City of Paris_	D. M. Bremner	D. Campbell, W. G. Stobbs, I. McBeath.	G. Fenton	,,	,, ,, ,,	,, ,, 26.8.36 to 18.10.36	27.10.36
271 *† _City of Roubaix_	H. Spencer, D.S.C.	J. M. Milne, K. G. Gregory, T. V. Birkett.	F. V. Kinder	M.	,, ,, ,,	,, ,, 6.10.36 to 23.10.36	20.11.36
272 *† _City of Singapore_	H. Parry	R. Price, D. G. Robertson, R. Broadbent.	S. Finn	,,	,, ,, ,,	,, ,, 13.8.36 to 20.11.36	27.11.36
035 *† _City of Sydney_	E. G. Hoppins	E. E. Mason, P. W. Sharpley, E. M. Robertson.	D. Scott	,,	,, ,, ,,	,, ,, 24.8.36 to 21.11.36	27.11.36
167 *† _City of Tokio_	G. Burton	F. Stranger, T. R. Pulford, H. M. Rome.	W. R. Jones	S.	,, ,, ,,	,, ,, 18.4.36 to 11.8.36	24.8.36
*† _City of Winchester_	E. Mason	G. T. Wilbett, D.R. Morris, A. G. Freeman.	... ...	,,	,, ,, ,,	Fm. 915 23.1.36 to 11.6.36	26.6.36
125 *† _City of Windsor_	J. B. Pattison	A. Westlake, H. B. Mole, R. S. Mann.	H. J. Coates	,,	,, ,, ,,	Fms. 911 & 138 8.9.36 to 5.11.36	2.12.36
*† _City of Yokohama_	A. S. Reay	R. J. Bushell	... ...	,,	,, ,, ,,	Fm. 911 14.8.36 to 15.9.36	22.10.36
027 *† _Clan Farquhar_	J. Waterhouse	J. Browne, T. A. Watkinson, J. Napier.	J. Morrison	M.	Clan Line Steamers, Ld.	Fms. 911 & 138 24.8.36 to 31.10.36	24.11.36
050 *† _Clan Macalister_	F. J. Stenson, R.D., A.D.C., Capt., R.N.R.	M. Bruce, J. Hubbard, R. C. V. Miles.	C. J. Andrews	S.	,, ,, ,,	,, ,, 21.9.36 to 11.10.36	11.11.36
222 *† _Clan Macdougall,_ M.V.	L. F. Redford, Lt.-Commr., R.N.R.	W. Graham, K. M. Banks, J. Laurie.	G. Turner	,,	,, ,, ,,	,, ,, 18.5.36 to 7.8.36	26.8.36
101 *† _Clan Macfarlane_	W. J. Hughes	J. E. Clayton, G. A. Fox, B. Grindlay.	T. M. Ferguson	,,	,, ,, ,,	,, ,, 27.6.36 to 19.9.36	6.10.36
118 *† _Clan Macindoe_	H. Andrews	C. Rogers, W. Tudman, A. J. Jenkins.	D. C. Munro	,,	,, ,, ,,	,, ,, 12.9.36 to 2.10.36	27.10.36
082 *† _Clan Macnair_	R. J. W. Bennett	R. W. Cook, R. Armstrong, F. C. Doyle.	J. W. Pollock	,,	,, ,, ,,	,, ,, 1.9.36 to 17.11.36	1.12.36
255 *† _Clan Macneil_	A. Low	W. R. Thomas, I. C. Scott, E. Coultas.	N. G. Swanson	,,	,, ,, ,,	,, ,, 2.9.36 to 19.11.36	24.11.36
001 *† _Clan Macphee_	J. H. Crellin	S. S. Stammwitz, H. Westacott	W. Scott	,,	,, ,, ,,	,, ,, 2.9.36 to 6.11.36	9.11.36
168 *† _Clan Mactaggart_	C. C. Parfitt	C. A. Thomas, J. Gardener, R. F. Millett.	J. G. Wood	,,	,, ,, ,,	,, ,, 18.8.36 to 10.9.36	14.9.36
002 *† _Clan Macwhirter_	P. M. Macfarlane	A. Woodall, J. V. Findlay, T. P. Cranwell.	D. T. Drover	,,	,, ,, ,,	,, ,, 5.8.36 to 20.10.36	24.11.36
109 *† _Clan Morrison_	R. P. Galer, R.D., Commr., R.N.R.	R. Carpmael, F. B. Fairweather	W. MacAlister	,,	,, ,, ,,	,, ,, 11.9.36 to 16.10.36	27.10.36
*† _Clement_	W. C. H. Jones O. J. P. Lee	S. Pollock, R. Parry, G. G. Westhrop.	... ...	,,	Booth S.S. Co., Ld.	Fm. 915 13.11.35 to 19.10.36	28.10.36
041 *† _Clydebank,_ M.V.	W. Broome	E. Needham, A. Cornell, G. Mordaunt.	G. W. Dickson	S.	A. Weir & Co.	Fms. 911 & 138 23.8.36 to 7.9.36	6.10.36
016 *† _Comliebank,_ M.V.	V. Harper	L. W. Thorne, H. S. Brown	M. F. Cantillan	,,	,, ,, ...	,, ,, 25.7.36 to 24.9.36	20.11.36
185 †† _Comorin_	C. W. Cartwright, D.S.C.	R. H. Hand, G. W. du Fosse, F. D. Shaw.	E. Howard	M.-S.	P. & O. S.N. Co.	,, ,, 12.7.36 to 14.10.36	20.10.36
198 *† _Contractor_	H. Collins	A Moreton, J. H. Roberts, A. O. Lewis.	P. R. Gell	M.	T. & J. Harrison	,, ,, 12.9.36 to 9.10.36	3.11.36
187 *† _Coptic,_ M.V.	J. Avern, Commr., R.N.R.	C. W. Sendall, L. E. Edmeads, D. Ashley.	P. M. Edwards	S.	Shaw Savill & Albion Co., Ld.	,, ,, 15.3.36 to 15.6.36	29.6.36
258 †† _Corfu_	J. H. Biggs, R.D., Commr., R.N.R.	I. A. Leitch, W. T. C. Lethbridge, H. V. Williamson.	R. V. McCreath	M.-S.	P. & O. S.N. Co.	,, ,, 30.8.36 to 10.9.36	26.10.36
214 *† _Counsellor_	A. H. Frew	F. Steventon, A. J. Turner, W. Moore.	L. J. Delaney	M.	T. & J. Harrison	,, ,, 26.7.36 to 10.10.36	14.10.36
*† _Crispin_	F. P. Barlow	R. D. MacLeod	... ...	S.	Booth S.S. Co.,Ld	Fm. 911 17.7.36 to 20.9.36	6.10.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received.
036 *† *Cumberland*	E. A. Burton	N. A. Thomas, D. H. Chadwick, C. P. Robinson.	E. D. Slater	S.	Federal S.N. Co., Ld.	Fms. 911 & 138 5.3.36 to 16.6.36	29.6.36
274 *† *Custodian*	T. J. Lacey	R. E. Harvey, T. B. Littlechild, W. Pemberton.	A. Morton	M.	T. & J. Harrison	,, ,, 15.6.36 to 21.8.36	26.8.36
169 *† *Dalgoma*, M.V.	P. H. Beeching	T. Everett, A. Nixon, S. Lawrence.	R. G. Newman	,,	British India S.N. Co., Ld.	,, ,, 9.8.36 to 24.10.36	3.11.36
*† *Dearne*	T. H. Woodhead	G. A. Tree		M.L.	L.M. & S. Rly.	Fm. 915 22.5.36 to 19.9.36	2.10.36
*† *Deebank*	J. K. Brook, D.S.O., R. D., Commr., R.N.R.	A. Cameron, R. A. Lorains, M. A. Bulley.		,,	A. Weir & Co.	,, 3.2.36 to 8.7.36	20.8.36
*† *Derbyshire*, M.V.	G. L. English	G. Meggitt		S.	Bibby Bros. & Co.	Fm. 911 29.8.36 to 5.11.36	20.11.36
138 *† *Designer*	W. A. Hansen	J. H. Lowe, J. Walter, G. Crispin.	P. Bird	M.	T. & J. Harrison	Fms. 911 & 138 1.7.36 to 15.9.36	6.10.36
061 *† *Devon*	J. Blencowe	H. C. Turner, K. Margerrison	W. B. Charlton	,,	British India S.N. Co., Ld.	,, ,, 10.8.36 to 14.9.36	20.10.36
072 *† *Director*	W. Rowberry	J. E. Bromley, H. Philpott, A. A. Johnson.	A. F. Haslam	,,	T. & J. Harrison	,, ,, 29.6.36 to 30.8.36	8.9.36
060 *† *Discovery II*, R.R.S.	L. C. Hill, O.B.E., Lt. R.N.R.	R. Walker, H. Kirkwood, T. Oates	A. L. Morris	M.L.	Discovery Committee.	Fm. 915 1.2.36 to 17.6.36	25.7.36
136 *† *Doric Star*	N. G. Oswald	F O. W. Stokes, R. W. Gill, J. J. Dixon.	D. Evans	M.	Blue Star Line, Ld.	Fms. 911 & 138 14.4.36 to 8.8.36	20.8.36
058 *† *Dorset*, M.V.	F. Ashworth	H. S. Dawson, J. R. Ricketts, J. R. Brownings.	J. McCarthy	,,	Federal S.N. Co., Ld.	,, ,, 20.5.36 to 7.9.36	17.9.36
142 †† *Duchess of Atholl*	C. H. Sapsworth	W. R. Thorburn, F. Falconer, C. Duggan.	E. Murphy	M.-S.	Canadian Pacific Steamships, Ltd.	,, ,, 13.9.36 to 29.10.36 Fm. 912 13.9.36 to 29.10.36	3.11.36 3.11.36
152 †† *Duchess of Bedford.*	W. B. Coyle, R.D., Commr., R.N.R.	E. J. Oatridge, F. Roberts, R. McKillop.	W. Davies	,,	,, ,,	Fms. 911 & 138 23.8.36 to 6.11.36 Fm. 912 23.8.36 to 6.11.36	9.11.36 9.11.36
151 †† *Duchess of Richmond.*	H. A. Moore, R.D., Commr., R.N.R.	F. W. S. Roberts, W. A. Stanley.	F. Yorston	S.	,, ,,	Fms. 911 & 138 4.9.36 to 30.10.36 Fm. 912 4.9.36 to 30.10.36	20.11.36 20.11.36
143 †† *Duchess of York*	A. Rothwell	L. H. Davis, R. Burns, B. Butcher.	J. W. Potts	M.-S.	,, ,,	Fms. 911 & 138 6.9.36 to 20.11.36 Fm. 912 6.9.36 to 20.11.36	1.12.36 1.12.36
*† *Duke of Argyll*	T. W. Richmond	H. Thompson, P. Green	G. Poulton	S.	L.M.S. Railway	Fms. 911 & 138 4.9.36 to 7.11.36	11.11.36
*† *Duke of Lancaster*	H. Clarke	J. Irwin, W. Cole, N. Greenwood.	F. Garrett	,,	,, ,,	,, ,, 22.8.36 to 28.10.36	3.11.36
*† *Duke of Rothesay*	F. C. Raven	A. E. Willmott, S. Green	G. Pilling	,,	,, ,,	,, ,, 9.8.36 to 15.11.36	23.11.36
253 *† *Dumana*, M.V.	H T. Hudson, R.D., Capt., R.N.R.	C. W. Allerton, P. W. Clark		M.	British India S.N. Co., Ld.	,, ,, 5.8.36 to 22.10.36	27.10.36
098 †† *Dunbar Castle*, M.V.	A. H. Blackman E. A. Comley	G. Mackay, T. F. E. Wyatt	P. P. Williams	S.	Union-Castle Mail S.S. Co., Ld.	,, ,, 28.3.36 to 16.8.36	28.8.36
*† *Dunedin Star*, M.V.	J. Fisher	J. Byrne		M.	Blue Star Line, Ld.	Fm. 911 6.7.36 to 12.10.36	16.10.36
193 †† *Dunnottar Castle*, M.V.	A. H. Blackman	R. F. Pembry, B. Dickinson	J. Gilbart	S.	Union-Castle Mail S.S. Co. Ld.	Fms. 911 & 138 26.9.36 to 20.11.36	1.12.36
052 *† *Dunster Grange*, M.V.	A. B. Friend	E. G. Raynor, A. Seybold, E. Stone.	J. A. Vallance	M	Furness Lines	,, ,, 10.8.36 to 14.10.36	20.10.36
043 †† *Dunvegan Castle*, M.V.	H. R. Northwood	A. Hurry, H. Holland	A. C. Hurtis	S.	Union-Castle Mail S.S. Co. Ld.	,, ,, 20.9.36 to 5.11.36	11.11.36
102 *† *Duquesa*	C. R. Frost	D. Murray, A. McEwan, R. F. Martin.	A. Stander	M	Furness Lines	Fms. 911 & 138 21.6.36 to 19.8.36	24.8.36
064 *† *Durham*, M.V.	H. L. Upton, D.S.C., R.D., Capt., R.N.R.	R. H. Chapman, A. W. Marshall, E. J. Ormsby.	J. V. Stockman	,,	Federal S.N. Co., Ld.	,, ,, 14.7.36 to 3.11.36	11.11.36
*† *Eastern Coast*	W. Quirk	E. Owen, E. Greenall		M.L.	Coast Lines, Ld.	Fm. 915 16.11.35 to 19.5.36	17.8 36
077 †† *Edinburgh Castle*	E. S. Comley	A. H. Parry, G. A. Jones	R. Brew	S.	Union-Castle Mail S.S. Co., Ld.	Fms. 911 & 138 13.9.36 to 31.10.36	3.11.36
107 *† *El Argentino*, M.V.	F. Ellis, D.S.C.	H. N. Sherwell, G. Brighton, J. G. Freeman.	T. Horne	M.	Furness Lines	,, ,, 21.9.36 to 25.11.36	2.12.36
009 *† *Elmworth*, M.V.	A. W. Gofton	L. Harper, L. Lidguard, V. Robson.	H. G. Williams	,,	R. S. Dalgleish	,, ,, 11.8.36 to 26.9.36	3.11.36
108 *† *Elstree Grange*	G. N. Brien, Commr. R.N.R.	J. Knight, R. M. T. Jones	M. K. Hore	,,	Furness Lines	,, ,, 11.9.36 to 26.10.36	3.11.36
110 *† *El Uruguayo*	T. McNamara	G. R. Thomas, F. E. Hailstone, P. L. Grant.	P. J. Vere	,,	,, ,,	,, ,, 1.8.36 to 29.9.36	6.10.36
034 †† *Empress of Britain.*	G. R. Parry, R.D., Commr., R.N.R.	W. S. Main, A. C. Harrisson, D. Dunn.	J. P. Jones	S.	Canadian Pacific Steamships, Ld.	Fms. 911 & 138 6.9.36 to 11.11.36	20.11.36
154 †† *Empress of Canada.*	J. F. Patrick	C. F. Alltree, G. E. Murrell, J. McQuarie.	J. Newberg	M.L.	,, ,, ,,	Fm. 915 22.5.36 to 16.9.36	27.10.36
153 †† *Empress of Japan*	L. D. Douglas, R.D., Lt.-Commr., R.N.R. W. T. Kinley	S. Fieldhouse, E. Connorton, V. E. Jaynes.	J. McClure	,,	,, ,, ,,	,, 26.6.36 to 15.10.36	24.11.36
119 †† *Erin*	R. C. Vigurs	W. A. Phillips, V. Hill, W. N. M. Faichney	J. O'Shaughnessy	S.	Erin S.S. Co., Ld.	Fms. 911 & 138 3.9.36 to 15.11.36 Fm. 912 3.9.36 to 15.11.36	24.11.36 24.11.36
075 *† *Esperance Bay*	W. C. Meek, R.D., Lt.-Commr., R.N.R.	E. Johansen, J. Lindhart, J. Carroll.	A. R. Porter	M.	G. Thompson & Co., Ld.	Fms. 911 & 138 10.3.36 to 10.8.36	20.8.36
*† *Explorer*	T. G. Fraser	T. R. Ness, F. O. Sheekey		M.L.	Scottish Fishery Board	Fm. 915 25.2.36 to 30.7.36	10.8.36
124 *† *Fordsdale*	F. Smith	A. Warren, E. Sainsbury, D. McLean.	H. Bloxham	S.	Shaw, Savill & Albion Co., Ld.	Fms. 911 & 138 13.6.36 to 18.9.36	28.9.36
239 *† *Foylebank*, M.V.	H. J. Smith	J. E. Allen, W. Blakeney, V. Holmes.	A. J. Locke	,,	A. Weir & Co.	Fms. 911 & 138 16.7.36 to 18.10.36	2.12.36
173 †† *Franconia*	P. R. Vaughan, D.S.C., R.D., Commr., R.N.R. A. T. Brown, R.D., Capt. R.N.R.	F. Patchett, B. Tanner, D. McLean.	T. F. Wyatt	,,	Cunard White Star Ld.	,, ,, 30.8.36 to 20.10.36	22.10.36
159 *† *Fresno City*, M.V.	J. W. Potts	P. J. Ryan, P. W. Davies, E. Scott.	E. P. Place	,,	Sir Wm. Reardon Smith & Partners, Ld.	Fms. 911 & 138 18.7.36 to 28.8.36	20.11.36
*† *Gaelic Star*	G. C. H. Noakes, Lt.-Commr., R.N.R.	E. P. S. Lewis		,,	Blue Star Line, Ld.	Fm. 911 5.6.36 to 1.9.36	17.9.36
186 †† *Georgic*, M.V.	J. C. Townley, R.D., Capt., R.N.R.	J. C. Dawson, J. V. Locke, L. Thompson.	H. S. Reid	,,	Cunard White Star, Ld.	Fms. 911 & 138 27.7.36 to 6.11.36	11.11.36
234 *† *Glaucus*	W. G. Harrison	E. W. Studley, W. K. Kerr, W. T. Harris.	G. E. Turner	M.L.	A. Holt & Co.	Fm. 915 4.3.36 to 18.6.36	28.7.36
026 *† *Glenbank*, M.V.	E. N. K. Blackmore	C. Sherwood, W. McBean, H. Lawrence.	V. Benest	S.	A. Weir & Co.	Fms. 911 & 138 10.8.36 to 19.9.36	9.11.36
126 *† *Glengarry*, M.V.	E. Waite	H. K. Marton, P. G. Neill, R. A. Harvey	W. Fleming	M.	Glen Line, Ld.	,, ,, 27.7.36 to 5.11.36	9.11.36
111 *† *Hardwicke Grange*	W. H. Fowler	W. F. Heritage, V. Elsegood, R. Williams.	H. Preston	,,	Furness Lines	,, ,, 27.7.36 to 1.10.36	8.10.36
218 *† *Har[illegible]des*	F. R. Elwell	F. J. P. Murphy, A. G. Beynon, V. Green.	H. Davies	S.	Houston Line, Ld.	,, ,, 27.5.36 to 12.10.36	20.10.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received.
262 *† *Hauraki*, M.V.	F. L. G. Jaunay A. W. Cheese	D. C. N. Champion, W. McGarry, J. H. Ibbotson.	E. Gittings	M.L.	Union S.S. Co., of N.Z., Ld.	Fm. 915 23.4.36 to 25.7.36	3.10.36
171 *† *Hertford*	J. Burton Davies	R. Coen, H. Cockerill, W. V. Canton.	P. Moroney	S.	Federal S.N. Co., Ld.	Fms. 911 & 138 1.4.36 to 6.5.36	26.5.36
*† *Hibernia*	J. R. Bulmer	W. E. Meade ...	D. T. Rockey	,,	L.M. & S. Railway	,, ,, 23.5.36 to 12.9.36	17.9.36
182 †† *Highland Brigade*, M.V.	R. G. Clayton, D.S.C., R.D., Capt., R.N.R.	N. Middleton, J. James, N. Seaton.	J. Reynolds	M.-S.	Royal Mail Lines, Ld.	,, ,, 20.8.36 to 6.10.36	12.10.36
116 †† *Highland Chieftain*, M.V.	J. A. Hodges, R.D., Commr., R.N.R.	T. A. Buckney, W. E. Gelling, E. G. George.	T. Desboro	,,	,, ,, ,,	,, ,, 25.7.36 to 14.11.36	24.11.36
099 †† *Highland Monarch*, M.V.	H. Womersley	T. Fraser, G. Thomas, P. Bennock.	E. F. Weatherhead.	,,	,, ,, ,,	,, ,, 14.9.36 to 2.11.36	9.11.36
230 †† *Highland Patriot*, M.V.	R. H. Robinson	G. E. Leach, W. B. Tennant, C. D. M. Vine.	M. J. Carpenter	,,	,, ,, ,,	,, ,, 3.9.36 to 17.10.36	26.10.36
250 †† *Highland Princess* M.V.	A. E. Cornick	H. V. Todd, H. Davies, H. Bowker.	F. L. Stevens	,,	,, ,, ,,	,, ,, 6.8.36 to 20.9.36	28.9.36
261 *† *Huntingdon*	A. E. Taylor, R.D., Commr., R.N.R.	M. Young, C. Cremin, K. Barnett.	A. R. Mugridge	S.	Federal S.N. Co., Ld.	,, ,, 7.5.36 to 20.9.36	28.9.36
200 *† *Huntsman*	A. H. Brown	J. M. White, A. Thompson,	W. Hird	M.	T. & J. Harrison	,, ,, 17.6.36 to 5.9.36	21.9.36
*† *Imperial Star* M.V.	D. R. Macfarlane	D. G. Wenbourne	... ...	,,	Blue Star Line, Ld.	Fm. 911 6.6.36 to 1.9.36	8.10.36
260 *† *Inanda*	W. H. Gibbings	P. B. Jones, E. P. Simmons, W. C. Johnston.	E. J. Cook	,,	T. & J. Harrison	Fms. 911 & 138 20.9.36 to 27.10.36	9.11.36
197 *† *Ingoma*.	J. T. Ling	D. N. Penfold, J. L. Curle, F. R. Robinson.	R. Hammond	,,	,, ,,	,, ,, 23.8.36 to 28.11.36	3.12.36
144 *† *Inverbank*, M.V.	D. O'Donnell	L. C. Smith, D. Jackson.	H. Armstrong	S.	A. Weir & Co.	,, ,, 30.7.36 to 9.10.36	11.11.36
*† *Isle of Guernsey*	F. W. Hodges	H. J. Pellaw	F. O. Brown	,,	Southern Rly.	,, ,, 29.7.36 to 21.9.36	8.10.36
*† *Isle of Jersey*	H. M. Golding	C. Abbey.	T. Barron	,,	,, ,,	,, ,, 3.7.36 to 28.9.36	3.10.36
*† *Isle of Sark*	R. J. Large, M.B.E.	H. F. Breuilly, C. E. Purley.	T. Stubbs	,,	,, ,,	,, ,, 21.8.36 to 13.11.36	23.11.36
*† *Ixion*	W. A. Turner	A. R. Davidson, J. Gould, W. I. Symes.	F. C. Wall	M.L.	A. Holt & Co.	Fm. 915 18.6.36 to 5.9.36	21.10.36
226 *† *Javanese Prince*, M.V.	E. E. Jones	L. W. Cooper, H. Patterson, W. O. Young.	J. A. Campbell	,,	Furness Lines	,, 17.4.36 to 3.8.36	28.9.36
188 †† *Kaisar-i-Hind*	M. G. Draper, R.D., Commr., R.N.R.	H. J. Cholerton, E. R. Rose, A. L. Harper.	J. D. Downie	M.-S.	P. & O. S.N. Co.	Fms. 911 & 138 10.7.36 to 18.11.36	24.11.36
206 *† *Karamea*, M.V.	C. M. Andrews	L. B. Miller, N. S. Milne, V. A. Hickson.	A. Stratton	S.	Shaw Savill & Albion Co., Ld.	,, ,, 17.7.36 to 11.11.36	23.11.36
*† *Kent*	J. V. Williams	... ...	... ...	,,	Federal S.N. Co., Ld.	... ...	...
147 †† *Laconia*	B. B. Oram, R.D., Commr., R.N.R.	S. A. Jones, G. T. Kavanagh, J. Ashcroft.	R. M. Shore	,,	Cunard White Star, Ld.	Fms. 911 & 138 14.9.36 to 29.11.36	3.12.36
062 †† *Lancastria*	E. Edkin, O.B.E., R.D., Capt., R.N.R.	W. T. Fitzgerald, O. V. Lucas, J. F. Drake.	W. F. Fay	,,	,, ,, ,,	,, ,, 7.9.36 to 15.11.36	23.11.36
076 *† *Largs Bay*	T. V. Roberts	H. A. Dunnett, J. Renton, R. Frisby.	S. G. Lewis	M.	G. Thompson & Co., Ld.	,, ,, 9.6.36 to 8.9.36	17.9.36
112 *† *La Rosarina*	S. Mathews	W. S. Hamblin, T. C. Townsend, J. C. Murray.	J. C. Harris	,,	Furness Lines	,, ,, 14.9.36 to 10.11.36	20.11.36
267 *† *Lassell*, M.V.	W. W. Watson	N. L. Knight, T. J. Sweeney, B. Green.	T. Allen	S.	Lamport & Holt Line, Ld.	,, ,, 20.7.36 to 29.9.36	12.10.36
083 *† *Lautaro*, M.V.	H. B. Reece, R.D., Capt., R.N.R.	G. Gerety, R. Skellorn, A. Turner.	W. A. Johnston	M.	Pacific S.N. Co.	,, ,, 9.7.36 to 20.10.36	26.10.36
251 *† *Levernbank*, M.V.	W. W. Elliott	A. J. Falnasser, J. D. Mountain	H. S. Matheson	S.	A. Weir & Co.	,, ,, 6.7.36 to 11.8.36	6.10.36
093 *† *Llandaff Castle*	G. H. Fogden	S. N. Smith	C. Willings	,,	Union-Castle Mail S.S. Co., Ld.	,, ,, 17.7.36 to 11.9.36	28.9.36
094 *† *Llandovery Castle*	C. E. H. Aylen, R.D., Commr., R.N.R.	J. G. P. Lewis, S. S. Smith, J. A. Ferguson.	F. W. Longmore	,,	,, ,,	,, ,, 5.9.36 to 8.11.36	27.11.36
097 †† *Llangibby Castle*, M.V.	R. W. Goodacre	F. C. F. Longland	A. A. Sutton	,,	,, ,,	,, ,, 9.8.36 to 8.10.36	22.10.36
216 *† *Llanstephan Castle*	B. Ray	D. W. Sowden	R. Brew	,,	,, ,,	,, ,, 19.8.36 to 21.10.36	3.11.36
084 *† *Lobos*, M.V.	E. H. Large, R.D., Commr., R.N.R.	A. B. Powell, E. C. Hicks	T. McMinn	M.	Pacific S.N. Co.	,, ,, 24.5.36 to 21.8.36	24.8.36
137 *† *Logician*	E. B. Curphey	R. H. Ridley, W. S. Eustance, G. H. Howard.	R. V. Tibber	,,	T. & J. Harrison	,, ,, 25.8.36 to 11.11.36	20.11.36
*† *Loriga*	A. C. Taylor	... ...	... ...	M.	Pacific S.N. Co. Ld.	... ...	...
008 *† *Losada*, M.V.	R. E. Dunn, O.B.E.	R. J. G. Goodwin	A. R. Humphries	,,	,, ,, ,, ,,	Fms. 911 & 138 10.9.36 to 3.10.36	11.11.36
232 *† *Madura*	J. A. Wright	D. A. Jones, G. Suter, R. A. Bidmead.	H. O. Francis	,,	British India S.N. Co., Ld.	,, ,, 3.8.36 to 1.10.36	22.10.36
*† *Mahia*	W. T. Thompson	A. S. D. Masters, R. A. Costa, W. G. Bolton.	D. Irwin	S.	Shaw, Savill & Albion Co., Ld.	,, ,, 2.10.36 to 13.10.36	3.11.36
140 *† *Mahratta*	W. Hill	W. Nuttall, A. G. Gorham	H. M. Larritt	M.	T. & J. Brocklebank, Ld.	,, ,, 31.8.36 to 11.11.36	24.11.36
014 *† *Mahronda*	L. T. Owen	J. B. Leigh, J. B. Newman, A. Hill.	W. Ritch	,,	,, ...	,, ,, 23.9.36 to 29.10.36	9.11.36
015 *† *Mahsud*	W. T. King	H. Simpson, J. S. Richardson, P. Mackenzie.	G. D. Plant	,,	...	,, ,, 1.4.36 to 24.8.36	31.8.36
018 *† *Makalla*	J. Greenall	G. E. Thomas, H. Gillespie, D. O'Connor.	W. Fallowfield	,,	,, ...	,, ,, 29.6.36 to 22.9.36	1.10.36
225 *† *Makura*	D. MacDonald	E. V. Condon, J. N. Collins, J. L. Watson.	E. J. Gough	M.L.	Union S.S. Co. of N.Z., Ld.	Fm. 915 7.5.36 to 22.8.36	23.10.36
236 *† *Malayan Prince*, M.V.	W. Irvine	S. A. Headon, W. R. Harries, A. A. Spilman.	W. B. Ward	,,	Furness Lines	,, 13.6.36 to 25.9.36	17.11.36
219 *† *Malda*	J. G. Lindon H. M. Edmondson	J. F. Twite, A. W. Willis, D. O. Gough.	—. Gilman	M.	British India S.N. Co., Ld.	Fms. 911 & 138 22.11.35 to 3.2.36	8.6.36
195 †† *Maloja*	J. B. Browning, R.D., Commr., R.N.R.	J. C. Lapage, R. G. Wood, L. J. Cook.	A. Macbeth	M.-S.	P. & O. S.N. Co.	,, ,, 31.5.36 to 3.9.36	8.9.36
179 *† *Manchester Port*	P. Linton	W. Hine, F. L. Osborne, J. C. Briggs.	R. O'Connor	S.	Manchester Liners, Ld.	,, ,, 30.8.36 to 8.11.36	23.11.36
281 *† *Manchester Producer*.	G. M. Mitchell	L. A. Muir, W. H. Downing, R. O. Venn.	H. A. Counter	,,	,, ,,	,, ,, 10.9.36 to 14.11.36	23.11.36
146 *† *Mandasor*	C. Shaw	G. McL. Reid, S. Broughton, A. E. Evans.	P. F. Dunford	M.	T. & J. Brocklebank, Ld.	,, ,, 30.6.36 to 31.8.36	21.9.36
*† *Maron*, M.V.	J. H. Blyth, D.S.C.	L. C. Glynn, E. M. Robb, J. M. Whittle.	... ...	M.L.	A. Holt & Co.	Fm. 915 4.12.35 to 23.4.36	10.7.36
213 †† *Mashobra*	J. L. Beatty	L. Osborne, N. Lucas, G. Brignall.	A. M. Forbes	M.-S.	British India S.N. Co., Ld.	Fms. 911 & 138 17.8.36 to 28.10.36	24.11.36
235 †† *Mataroa*	A. McIntosh	E. B. Macfarren, R. S. Winder, A. C. Tyre.	H. Littlecott	S.	Shaw, Savill & Albion Co., Ld.	,, ,, 16.5.36 to 15.8.36	20.8.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received.
023 *† *Matheran*	H. D. Fulcher	A. D. Howard, R. Penston, W. Spencer.	J. Heathcote	M.	T. & J. Brocklebank, Ld.	Fms. 911 & 138 2.8.36 to 3.11.36	11.11.36
024 *† *Matra*	N. P. Cornish	T. H. Wardle, E. Watson, C. W. C. Parry.	E. R. Capps	,,	,, ,,	,, ,, 25.8.36 to 8.11.36	20.11.36
278 *† *Middlesex*	H. T. Wilde	E. G. Williams, R. A. Belfield, T. Alderman.	S. Jones	S.	Federal S.N. Co., Ld.	,, ,, 15.2.36 to 21.6.36	9.7.36
194 †† *Moldavia*	J. K. Chaplin, R.D., Capt., R.N.R.	A. A. Terry, J. Collinson, B. H. Pollitt.	J. Skinner	M.-S.	P. & O. S.N. Co.	,, ,, 6.7.36 to 21.8.36	31.8.36
199 †† *Mongolia*	H. R. Rhodes	E. J. Spurling, J. Paice, G. MacLean.	A. Morris	,,	,, ,, ,,	,, ,, 8.8.36 to 12.11.36	23.11.36
070 †† *Montcalm*	A. R. Meikle, R.D., Commr. R.N.R.	W. J. P. Roberts, H. M. Sanders, G. P. Billot.	J. Biggins	,,	Canadian Pacific Steamships, Ld.	,, ,, 30.8.36 to 10.10.36 Fm. 912 30.8.36 to 6.10.36	13.10.36 13.10.36
149 †† *Montclare*	W. S. Brown	T. Sargent, D. Ewing, F. Hicks.	H. A. Bowman	,,	,, ,,	Fms. 911 & 138 30.8.36 to 8.10.36	12.10.36
150 †† *Montrose*	C. Richardson	N. Duck, C. Belton, N. Scallow.	A. G. Hill	S.	,, ,,	Fms.911 & 138 7.9.36 to 6.11.36 Fm. 912 7.9.36 to 6.11.36	9.11.36 9.11.36
164 †† *Mooltan*	F. E. French, R.D., Capt., R.N.R.	J. D. Strike, R. B. Webster, W. H. C. Wood Roe.	H. Williamson	M.-S.	P. & O. S.N. Co.	Fms. 911 & 138 5.5.36 to 5.8.36	13.8.36
196 †† *Mulbera*	W. A. Grant-Pyves	J. L. Richardson, N. K. Boyd	... ...	,,	British India S.N. Co., Ld.	,, ,, 14.9.36 to 15.10.36	9.11.36
078 *† *Myrtlebank*, M.V.	C. S. Holbrook	G. E. Linfield, T. H. Welton, D. C. Brawn.	E. A. Richards	S.	A. Weir & Co.	Fms. 911 & 138 16.10.36 to 13.11.36	27.11.36
073 *† *Nagara*	A. R. Murley	P. P. Matthews, F. G. Dawson, C. J. Senior.	J. Haughney	M.	Royal Mail Lines, Ld.	,, ,, 24.8.36 to 28.10.36	3.11.36
201 †† *Naldera*	E. F. Hannan, R.D., Commr., R.N.R.	D. G. D. Watson, F. W. J. Pearce, E. R. Physick.	R. T. Soans	S.	P. & O. S.N. Co.	,, ,, 7.6.36 to 9.9.36	14.9.36
*† *Nankin*	T. H. Scott White	H. Nuzum, W. Clark, G. Sweetman.	... ...	M.L.	Eastern and Australasian S.S. Co., Ld.	Fm. 915 2.5.36 to 26.7.36	14.10.36
227 *† *Nardana*	C. Dorkin-White	T. Bradwood, H. Goater, D. W. Austin.	S. V. Knight	M.	British India S.N. Co., Ld.	Fms. 911 & 138 15.6.36 to 19.10.36	20.11.36
202 †† *Narkunda*	J. H. Biggs, R.D., Commr., R.N.R.	W. W. Gow, W. N. Eade, W. R. Stockdale.	C. W. Herbert	M.-S.	P. & O. S.N. Co.	,, ,, 10.6.36 to 28.10.36	9.11.36
†† *Nascopie*	T. F. Smellie	A. H. Dobson	... ...	S.	Hudson's Bay Co.	Fm. 911 14.7.36 to 1.10.36	22.10.36
257 *† *Natia*	E. A. Bridges	... ...	... ...	M.	Royal Mail Lines, Ld.	Fms. 911 & 138 6.9.36 to 4.11.36	9.11.36
*† *Nellore*	T. J. Mills	D. G. May, A. G. Rose, J. H. Simpson.	... ...	M.L.	Eastern and Australasian S.S. Co., Ld.	Fm. 915 3.6.36 to 28.8.36	23.11.36
162 *† *Nestor*	J. J. Power	G. A. Gatt, W. B. Blair, I. Skurray.	C. Townsend	S.	A. Holt & Co.	Fms. 911 & 138 7.9.36 to 11.10.36	2.12.36
*† *Newfoundland*	T. H. Webber	J. E. Wilson, A. Hender, F. H. Jones.	W. C. Brock	,,	Furness Lines	,, ,, 22.8.36 to 23.11.36 Fm. 912 22.8.36 to 23.11.36	27.11.36 27.11.36
*† *New Zealand Star*, M.V.	G. Wilson	R. S. Hopper, A. H. Dare, L. Vernon.	... ...	M.	Blue Star Line, Ld.	Fm. 911 4.5.36 to 18.8.36	24.8.36
210 *† *Niagara*	W. Martin	D. H. Richards, H. Ruegg, F. Bowman.	G. M. Power	M.L.	Canadian-Australasian Line, Ld.	Fm. 915 26.3.36 to 11.7.36	9.9.36
*† *Northern Coast*	H. Cameron J. Williams F. Mara	R. E. Holt, F. H. Thomson, M. Gallagher.	... ...	,,	Coast Lines, Ld.	,, 6.4.36 to 29.8.36	19.9.36
181 *† *Nova Scotia*	J.W. Murphy	E. E. Sainty, C. H. Kenyon, J. G. Garner.	G. Penketh	S.	Furness Lines	Fms. 911 & 138 4.9.36 to 4.11.36 Fm. 912 8.10.36 to 5.11.36	9.11.36 9.11.36
243 *† *Opawa*, M.V.	H. G. B. Field	T. E. Davies, J. McCulloch, C. S. Thomas.	E. Short	M.	New Zealand Shipping Co., Ld.	Fms. 911 & 138 14.1.36 to 8.5.36	11.7.36
172 †† *Orama*	E. P. Cameron, R.D., Capt., R.N.R.	H. R. Treseder, G. H. Jones, J. N. Hulse.	J. W. Willson	S.	Orient S.N. Co., Ld.	,, ,, 25.5.36 to 25.8.36	31.8.36
080 *† *Orari*, M.V.	J. G. Almond	C. J. Cordran, H. R. Smith, J. Cree.	W. E. Fordham	M.	New Zealand Shipping Co., Ld.	,, ,, 30.7.36 to 31.8.36	14.10.36
246 †† *Orbita*	J. H. Kirkwood	P. H. Ray, D. Jones, D. W. Hutchison.	D. H. Sinclair	M.-S.	Pacific S.N. Co.	,, ,, 22.9.36 to 7.10.36	9.11.36
087 †† *Orduna*	C. W. Benson	R. D. Eckford, B. Morgan, E. C. Hicks.	W. G. Sutherland	,,	,, ,,	,, ,, 30.7.36 to 20.10.36	9.11.36
148 †† *Orford*	M. J. Sarson	C. Edgecombe, A. E. Coles, J. S. Stratford.	J. Macdonald	,,	Orient S.N. Co., Ld.	,, ,, 20.7.36 to 20.10.36	26.10.36
019 †† *Orion*	A. L. Owens,R.D.,Capt., R.N.R.	P. Sargent, K. M. Morrison, W. H. Barker.	A. F. Edwards	,,	,, ,, ,,	,, ,, 3.5.36 to 8.6.36	15.6.36
174 †† *Ormonde*	G. G. Thorne, R.D., Capt. R.N.R.	J. H. Smyth, E. M. MacKay, E. Walmesley.	L. J. Hadlen	S.	,, ,, ,,	,, ,, 29.3.36 to 1.7.36	28.7.36
085 †† *Orontes*	F. R. O'Sullevan	J. K. Johnson, J. D. Birch, W. A. Cooke.	N. A. Boon	M.-S.	,, ,, ,,	,, ,, 28.6.36 to 9.9.36	23.9.36
055 †† *Oronsay*	C. G. Matheson, D.S.O., R.D., Capt., R.N.R.	C. Pinckney, G. B. H. Jones, J. N. Hulse.	P. T. Darby	S.	,, ,, ,,	,, ,, 3.2.36 to 5.5.36	15.6.36
156 †† *Otranto*	L. V. James, D.S.C.	J. H. Smyth, F. K. Manly, W. A. Cooke.	J. L. Curry	M.-S.	,, ,, ,,	,, ,, 22.12.35 to 25.3.36	30.3.36
*† *Oxfordshire*	P. G. Cooper	P. G. Latimer	... ...	S.	Bibby Bros. & Co.	Fm. 911 5.7.36 to 12.9.36	3.10.36
044 *† *Pacific Exporter*, M.V.	C. E. Holland, R.D., Commr., R.N.R.	E. Jones, S. Lavis, W. Edmonds.	W. J. Moore	,,	Furness Lines	Fms. 911 & 138 22.6.36 to 16.9.36	28.9.36
*† *Paris*	C. G. G. Munton	E. W. Smith	W. Kelley	,,	Southern Rly.	,, ,, 21.9.36 to 19.10.36	24.11.36
*† *Penola*, Schooner	R. E. D. Ryder, Lieut., R.N.	Q. Riley, B. Roberts, I. F. Meiklejohn.	... ...	M.L.	British Graham Land Expedition.	Fm. 915 13.9.34 to 21.1.35	21.5.36
204 *† *Peshawur*	E. P. Parfitt	T. Hopkins, R. A. G. Brooks, E. J. Kerridge.	A. H. Garbett	M.	P. & O. S.N. Co.	Fms. 911 & 138 15.4.36 to 31.7.36	10.8.36
040 *† *Port Adelaide*	R. Williams	A. L. Walton, E. G. Jones, R. Aylward.	B. Baxter	S.	Commonwealth & Dominion Line, Ld.	,, ,, 2.4.36 to 21.7.36	28.7.36
238 *† *Port Alma*, M.V.	S. C. Cottell	G. Puttick, T. L. Kidwell, F. W. Elgar.	L. D. Corbett	,,	,, ,, ,,	,, ,, 16.2.36 to 22.5.36	8.6.36
128 *† *Port Auckland*	C. A. Robinson	E. C. Read, F. Taylor, E. Wheeler.	H. Jacobs	,,	,, ,, ,,	,, ,, 22.6.36 to 15.8.36	1.10.36
268 *† *Port Bowen*	A. H. Brown	R. E. Garner, E. W. Rogerson, D. N. Harries.	A. Naylor	,,	,, ,, ,,	,, ,, 15.5.36 to 5.9.36	28.9.36
190 *† *Port Chalmers*, M.V.	J. E. Compton	W. B. Hopkins, P. H. Pendrick, A. Alexander.	T. Bagnall	,,	,, ,, ,,	,, ,, 28.5.36 to 30.9.36	8.10.36
131 *† *Port Darwin*	J. J. Hudson	K. D. Morgan, V. G. Battle, R. J. W. Baxter.	J. D. Lovelock	,,	,, ,, ,,	,, ,, 13.5.36 to 6.10.36	22.10.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received
*† *Port Dunedin*, M.V.	G. W. Hearn	A. Brown, W. B. Craig, P. R. Bradnee.	W. J. B. Craig	S.	Commonwealth & Dominion Line, Ld.	Fms. 911 & 138 20.5.36 to 29.8.36	9.9.36
010 *† *Port Fremantle*, M.V.	R. S. Durham, D.S.O.	F. R. Gorman, A. Young, P. Becham.	A. Scougall	,,	,, ,, ,,	,, ,, 21.2.36 to 28.6.36	9.7.36
163 *† *Port Gisborne*, M.V.	W. G. Higgs	N. J. Dedman, D. F. Morgan, R. R. Russel.	E. Mooney	,,	,, ,, ,,	,, ,, 20.8.36 to 27.9.36	26.10.36
*† *Port Hobart*, M.V.	T. Kippins, D.S.C.	J. S. Moate	...	,,	,, ,, ,,	Fm. 911 27.7.36 to 20.11.36 Fm. 912 27.7.36 to 20.11.36	3.12.36 3.12.36
*† *Port Townsville*, M.V.	S. W. Hayter	J. L. Porter, E. F. Beard, W. D. Henderson.	E. F. Whibley	,,	,, ,, ,,	Fms. 911 & 138 26.6.36 to 10.10.36	26.10.36
177 *† *Port Wellington*	R. Needham	W. M. Clough, G. F. Pannett, D. A. Bates.	W. L. Poingdestre	,,	,, ,, ,,	,, ,, 17.4.36 to 2.9.36	14.9.36
003 *† *Port Wyndham*, M.V.	W. Gilling	J. G. Thom, G. B. Lovegrove, R. C. Webb.	W. Jones	,,	,, ,, ,,	,, ,, 20.3.36 to 20.7.37	6.8.36
*† *Prague*	F. E. Beeching, D.S.C.	E. H. Lawrence, A. W. Greenham.	A. Potter	,,	L. & N.E. Rly.	,, ,, 6.9.36 to 31.10.36	3.11.36
106 *† *Princesa*	W. E. Williams	H. Butler, O. S. Sheard, F. Poulson.	M. Musgrave	M.	Furness Lines	,, ,, 31.8.36 to 24.10.36	3.11.36
063 *† *Queen City*	R. V. Arkwright	J. W. Botterill	...	S.	Sir Wm. Reardon Smith & Partners, Ld.	,, ,, 25.5.35 to 7.11.35	9.12.35
183 †† *Queen Mary*	R. B. Irving, O.B.E., R.D., Capt., R.N.R. R. V. Peel, R.D., Commodore, R.N.R.	R. H. Shaw, F. G. Watts, H. V. Clarke.	S. W. Brown	,,	Cunard White Star, Ld.	,, ,, 3.9.36 to 22.11.36	24.11.36
165 *† *Radnorshire*, M.V.	D. E. Evans	E. Saville, J. A. A. Evans, F. Gardiner.	I. T. Davies	,,	A. Holt & Co.	,, ,, 5.10.36 to 13.10.36	22.10.36
205 †† *Rajputana*	H. Williams	I. M. Sinclair, E. V. Lewis	W. Banbury	M.-S.	P. & O. S.N. Co.	,, ,, 5.7.36 to 7.10.36	9.11.36
228 †† *Ranchi*	C. E. Short	C. Hutchinson, J. MacArthur, R. S. Kerridge.	W. Stevenson	,,	,, ,, ,,	,, ,, 24.5.36 to 26.8.36	31.8.36
224 †† *Rangitane*, M.V.	A. W. McKellar, R.D., Capt., R.N.R.	L. Mercer, S. R. Leggett, M. L. Warren.	W. E. Smith	,,	New Zealand Shipping Co., Ld.	,, ,, 25.7.36 to 25.10.36	9.11.36
217 †† *Rangitata*, M.V.	E. Holland	H. P. Williamson, D. H. Clegg, P. M. Church.	H. R. Dedman	,,	,, ,, ,,	,, ,, 27.6.36 to 27.9.36	12.10.36
105 †† *Rangitiki*, M.V.	H. Barnett	H. Baddeley	...	,,	,, ,, ,,	...	...
207 †† *Ranpura*	J. M. Legg	A. C. Halliday, C. H. Stokes, G. Randall.	J. R. C. Johnson	,,	P. & O. S.N. Co.	Fms. 911 & 138 2.8.36 to 4.11.36	24.11.36
071 †† *Rawalpindi*	R. C. Dene	A. P. Godfrey, J. D. Green, H. P. Mallett.	S. W. Sharp	,,	,, ,, ,,	,, ,, 16.8.36 to 18.11.36	23.11.36
247 *† *Recorder*	J. J. Egerton	G. McGuinness, L. Harriman, D. Woolstenholme.	W. Murray	M.	T. & J. Harrison	,, ,, 5.9.36 to 3.10.36	12.10.36
132 *† *Reina del Pacifico*, M.V.	A. Ridyard, O.B.E.	J. K. Campbell, R. Bridson, S. E. Ayland.	J. B. Stone	,,	Pacific S.N. Co.	,, ,, 31.8.36 to 18.10.36	22.10.36
276 †† *Remuera*	F. W. Robinson	H. Hill, R. S. Frost, R. S. Warren.	E. Lawrence	S.	New Zealand Shipping Co., Ld.	,, ,, 6.4.36 to 17.7.36	24.7.36
*† *Rhexenor*	R. C. Neville	G. E. Towill, P. Dunsine, J. T. Jones.	...	M.L.	A. Holt & Co.	Fm. 915 29.4.36 to 17.8.36	21.10.36
*† *Rotorua*	C. B. Lamb	R. H. Carter, L. W. Fulcher, N. Warren.	...	M.	New Zealand Shipping Co., Ld.	,, 1.3.36 to 28.6.36	15.8.36
203 *† *Royal Star*	O. C. Roberts	N. Clarkson, E. O. Prickett, G. T. King.	R. C. Stone	,,	Blue Star Line, Ld.	Fms. 911 & 138 16.8.36 to 31.8.36	26.10.36
*† *Ruahine*	G. Kinnell	J. E. Clarke	...	S.	New Zealand Shipping Co., Ld.	Fm. 911 3.5.36 to 21.9.36	28.9.36
*† *St. Helier*	R. Pitman	G. Cartwright	E. Trapnell	,,	G.W. Railway	Fms. 911 & 138 8.9.36 to 31.10.36	9.11.36
*† *St. Julien*	L. Richardson	T. Wilmot	...	,,	,, ,,	,, ,, 1.7.36 to 17.10.36	20.10.36
*† *St Patrick*	...	...	...	,,	,, ,,	...	...
100 †† *Samaria*	J. McRostie	W. F. Dennison, R. G. Roberts, W. M. Stewart.	R. A. J. Owlett	,,	Cunard White Star, Ld.	,, ,, 23.8.36 to 8.11.36	11.11.36
*† *San Adolfo*, M.V.	H. Paterson	W. S. Lamb	...	M.-S.	Eagle Oil & Shipping Co., Ld.	Fm. 911 6.8.36 to 19.11.36	27.11.36
*† *San Alberto*, M.V.	C. Vidot	P. Menzies	...	,,	,, ,,	,, 6.9.36 to 22.10.36	27.10.36
*† *San Alvaro*, M.V.	A. Riddel, R.D., Capt., R.N.R.	N. D. Swaffin	...	,,	,, ,,	,, 1.10.36 to 6.11.36	9.11.36
*† *San Arcadio*, M.V.	F. Harrison	R. E. Kirkley	...	,,	,, ,,	,, 23.8.36 to 2.11.36	9.11.36
*† *Scotia*	W. T. Griffith	N. Lloyd Williams	J. H. Rockey	S.	L.M. & S. Railway	Fms. 911 & 138 2.8.36 to 19.9.36	1.10.36
170 †† *Scythia*	G. R. Dolphin, R.D., Commr. R.N.R.	J. Quayle, R. Conway, W. K. Hunter.	P. Forsyth	,,	Cunard White Star, Ld.	,, ,, 31.8.36 to 8.11.36	1.12.36
211 *† *Shropshire*, M.V.	R. S. Evans, O.B.E.	G. W. Dobson, A. E. Evans, A. E. Young.	G. C. Talbot	,,	Bibby Bros. & Co.	,, ,, 13.9.36 to 19.11.36	24.11.36
121 *† *Siamese Prince*, M.V.	E. Hardcastle	R. Jones, F. L. Bourgot, R. Dennis.	A. Webster	M.L.	Furness Lines	Fm. 915 20.5.36 to 27.8.36	21.10.36
*† *Silverwalnut*, M.V.	J. Smith, Lt.-Commr., R.N.R. C. S. C. Cherry	G. H. Morgan, H. J. Dean, W. S. Welford.	A. Johnston	,,	S. & J. Thompson, Ld.	,, 27.12.35 to 2.7.36	27.10.36
141 *† *Somerset*	C. R. Pilcher	R. H. Browne, H. M. Knight, J. A. C. Knott.	F. W. Dennis	S.	Federal S.N. Co., Ld.	Fms. 911 & 138 29.12.35 to 16.5.36	26.5.36
* *Spero*	W. A. Dossar	C. Hodgson, J. R. Atkinson	...	M.L.	Ellerman Wilson's Line, Ld.	Fm. 915 11.7.36 to 7.11.36	16.11.36
*† *Staffordshire*, M.V.	P. H. Potter	C. Powrie	...	S.	Bibby Bros. & Co.	Fm. 911 26.9.36 to 22.10.36	2.12.36
134 †† *Stirling Castle*, M.V.	C. E. Stuart, R.D., Capt. R.N.R.	F. G. McIver, F. Marriot	G. Scurr	,,	Union-Castle Mail S.S. Co., Ld.	Fms. 911 & 138 13.6.36 to 1.8.36	6.8.36
020 *† *Stirlingshire*, M.V.	A. Mackinlay	C. R. H. Tribe, C. R. Perrin, R. L. Smallbone.	P. B. Allison	,,	Turnbull, Martin & Co., Ld.	,, ,, 3.8.36 to 10.11.36	20.11.36
270 †† *Strathaird*	J. M. M. Tickell	C. Mayne, J. Johnson, A. R. Bishop.	F. W. Helmn	,,	P. & O. S.N. Co.	,, ,, 24.7.36 to 30.9.36	8.10.36
277 †† *Strathmore*	R. Harrison, D.S.O., R.D., Capt., R.N.R.	G. V. Legassick, D. Cutler, E. M. Quinn.	H. R. Cheese	M.-S.	,, ,, ,,	,, ,, 1.9.36 to 20.10.36	22.10.36
059 †† *Strathnaver*	E. H. Starling	C. J. Collingwood, G. R. Peters, H. V. Williamson.	P. R. Hobbs	,,	,, ,, ,,	,, ,, 17.5.36 to 19.8.36	28.8.36
229 *† *Tactician*	A. J. Meek	T. O. Jones, E. Bennet, W. Rennie.	R. Reid	M.	T. & J. Harrison	Fms. 911 & 138 7.9.36 to 16.11.36	23.11.36
241 †† *Tainui*	W. H. P. Jackson	...	...	S.	Shaw Savill & Albion Co., Ld.	...	...
081 *† *Tairoa*	S. . Oswald	W. G. Burt, A. McSporran, W. G. H. Bolton.	L. F. J. Cosgrave	,,	,, ,, ,,	Fms. 911 & 138 29.4.36 to 4.9.36	17.9.36
021 †† *Tamaroa*	W. Dawson	C. A. Meyer, A. Blewitt, J. C. Paige.	P. Maloney	M.-S.	,, ,, ,,	,, ,, 9.8.36 to 10.11.36	20.11.36
264 *† *Tanda*	E. T. Pilcher, Lt.-Commr., R.N.R.	E. J. B. Wright, F. O. Colvin, B. W. Dun.	W. H. Harris	M.L.	Eastern and Australasian S.S. Co., Ld.	Fm. 915 18.4.36 to 29.6.36	2.9.36
047 *† *Taranaki*, M.V.	G. Williams	D. W. Campbell, A. J. Tillott, A. G. Fisher.	G. Goodsall	S.	Shaw, Savill & Albion Co., Ld.	Fms. 911 & 138 22.6.36 to 15.10.36	3.11.36

Name of Vessel.	Captain.	Observing Officers.	Senior Wireless Operator.	Meteorological Instrument Equipment.	Owners.	Logs, Registers, or Records Contributed. 11.9.36 to 5.12.36.	Date Last Return Received.
048 †† *Themistocles*	C. Wood, D.S.C.	R. F. Hamilton, G. Hawley, J. Downs.	D. Dochray	M.-S.	Shaw, Savill & Albion Co., Ld.	Fms. 911& 138 3.3.36 to 29.6.36	13.7.36
*† *Thistleglen*	G. A. Whitfield, O.B.E.	T. N. Dalton, A. P. Raine, G. W. Cranmer.	H. F. F. Cornwell	M.	Allan, Black & Co.	Fm. 911 23.6.36 to 5.9.36	20.10.36
*† *Tinhow*	D. I. C. Robertson	W. P. Wheeler	... ...	,,	A. Weir & Co.	,, ,, 28.7.36 to 26.10.36	2.12.36
161 *† *Titan*	C. J. Watson	T. S. Hardy, P. Elder, R. E. Agar.	R. J. Seaman	S.	A. Holt & Co.	Fms. 911 & 138 23.7.36 to 25.9.36	6.10.36
242 *† *Tongariro*	P. B. Clarke, D.S.C.	G. W. Pring, G. Jarvis, H. C. Dell.	E. G. Stride	,,	New Zealand Shipping Co., Ld.	,, ,, 23.2.36 to 20.6.36	30.7.36
025 †† *Transylvania*	D. W. Bone	R. L. Robertson, B. S. Leiper, R. Coates.	J. McDonald	,,	Anchor Line, Ld.	,, ,, 13.9.36 to 1.11.36	9.11.36
088 *† *Tudor Star*	J. Taylor	F. W. Grist, J. A. Golightly, S. W. Lane.	T. W. Pierson	,,	Blue Star Line, Ld.	,, ,, 20.8.36 to 30.10.36	24.11.36
245 *† *Turakina*	J. Laird	H. Forster, J. Romsey, W. T. Glassborow.	R. W. Hunn	M.	New Zealand Shipping Co., Ld.	,, ,, 30.6.36 to 24.10.36	1.12.36
104 †† *Tuscania*	W. B. Rome	D. I. Chamberlin, J. Noble	L. A. Harvey	S.	Anchor Line, Ld.	{ ,, ,, 2.9.36 to 16.11.36 { Fm. 912 2.9.36 to 16.11.36	23.11.36 23.11.36
127 *† *Tuscan Star*, M.V.	G. J. Lewis	R. T. Hales, C. H. Watson, W. Ashton.	G. H. Killick	,,	Blue Star Line, Ld.	Fms. 911 & 138 26.5.36 to 5.9.36	17.9.36
221 †† *Tynefield*, M.V.	M. Manthorpe	A. D. Lombard, R. F. Murray, G. Paterson.	B. G. Maguire	,,	Hunting & Son, Ld.	,, ,, 9.8.36 to 14.11.36	20.11.36
113 *† *Upwey Grange*, M.V.	R. Smiles	A. Bradbury, G. T. Hurst, P. J. Walker.	S. Thomas	M.	Furness Lines	,, ,, 20.7.36 to 15.9.36	21.9.36
176 *† *Vancouver City*, M.V.	H. C. Egerton	J. K. Robson, H. David, D. C. MacLeay.	C. S. Watson	S.	Sir Wm. Reardon Smith & Partners, Ld.	,, ,, 21.8.36 to 23.10.36	9.11.36
231 †† *Vandyck*	P. Symons	J. A. Baragwanath, J. Edgar, A. N. Blundell.	F. Slater	,,	Lamport & Holt, Ld.	,, ,, 6.9.36 to 16.9.36	21.9.36
079 †† *Viceroy of India*	E. A. J. W. Carter, R.D., Capt., R.N.R.	J. C. N. Shrubsole, K. H. Cummins, M. A. Trenfield.	H. S. Horn	M.-S.	P. & O. S.N. Co.	,, ,, 20.6.36 to 3.11.36	9.11.36
*† *Vienna*	H. Pickering	R. Greenfield, R. L. Stephenson.	G. Madle	S.	L. & N.E. Rly.	,, ,, 2.9.36 to 24.10.36	3.11.36
263 *† *Waiotapu*	J. Rankine	C. Carter, P. Ryan, H. Peel	G. Maxwell	M.L.	Union S.S. Co. of N.Z., Ld.	Fm. 915 23.4.36 to 15.8.36	23.10.36
004 †† *Waipawa*, M.V.	J. W. Johnson	K. I. M. Owen, R. Barns, J. W. Paine.	J. A. Power	S.	Shaw, Savill & Albion Co., Ld.	Fms. 911 & 138 13.8.36 to 25.11.36	3.12.36
254 †† *Wairangi*, M.V.	H. R. Gordon	J. Collins, K. Miller, H. Anderson.	H. J. R. Preston	,,	,, ,, ,,	,, ,, 19.4.36 to 12.7.36	17.7.36
212 †† *Waiwera*. M.V.	J. H. Gaskell, R.D., Lt.-Commr., R.N.R.	R. Grant, R. G. James, A. Mackenzie.	W. L. Starr	,,	,, ,, ,,	,, ,, 9.4.36 to 30.7.36	4.8.36
005 †† *Warwick Castle*, M.V.	A. O. Morgan, R.D., Commr., R.N.R.	A. J. Hart	J. Hodgson	,,	Union-Castle Mail S.S. Co., Ld.	,, ,, 8.8.36 to 29.11.36	3.12.36
056 *† *Westmoreland*	E. R. Kemp	C. B. Cathie, T. M. Devitt, D. G. White.	R. Glover	,,	New Zealand Shipping Co., Ld.	,, ,, 11.2.36 to 17.6.36	30.6.36
223 †† *William Scoresby*	C. R. U. Boothby, Lieut., R.N.R.	F. C. Freaker	... ...	M.L.	Discovery Committee.	... ...	...
208 †† *Winchester Castle*, M.V.	E. S. Vincent, R.D., Commr., R.N.R.	D. E. Smedley, E. W. Harvey	A. Donkin	S.	Union-Castle Mail S.S. Co., Ld.	Fms. 911 & 138 2.8.36 to 22.11.36	1.12.36
096 †† *Windsor Castle*	H. L. Scholefield	T. Conolly	G. S. Lewis	,,	,, ,,	,, ,, 5.9.36 to 25.10.36	3.11.36
053 *† *Worcestershire*, M.V.	R. P. Mann	N. F. Fitch, J. H. Barwick, H. Coffey.	J. Wylie	,,	Bibby Bros. & Co.	,, ,, 11.8.36 to 15.9.36	22.10.36
*† *Worthing*	B. Shaw	H. L. Smith	A. G. Sheppard	,,	Southern Railway	,, ,, 18.8.36 to 3.10.36	6.10.36
244 *† *Yoma*	J. A. Wilson	K. I. Macleod, E. W. Stubbs, J. S. Grassick.	R. S. Wilson	M.	P. Henderson & Co.	,, ,, 27.6.36 to 8.9.36	14.9.36
012 *† *Yorkshire*	F. W. L. Midgeley	N. A. C. Earthrowl, H. Davies, T. A. Gibson.	H. R. Ellis	S.	Bibby Bros. & Co.	,, ,, 10.5.36 to 18.7.36	27.7.36
*† *Zealandic*, M.V.	W. J. Saunders	S. P. Wallis, J. Stobbs, R. M. Pattinson.	F. W. Ward	,,	Shaw, Savill & Albion Co., Ld.	,, ,, 15.7.36 to 18.10.36	27.10.36
Conway, H.M.S.	T. M. Goddard, Commr., R.N.R.	The Senior Cadets	... ...	Cadets M.L.	... ...	Cadets Met. Log. 3.5.36 to 24.7.36	4.8.36
Pangbourne Nautical College.	A. B. Greig, O.B.E., D.S.C., Capt., R.N.	,, ,,	... ...	,,	... ...	,, ,, 24.4.36 to 21.7.36	24.7.36
Worcester, H.M.S.	G. C. Steele, V.C., Commr., R.N.	,, ,,	... ...	,,	... ...	,, ,, 9.5.36 to 30.7.36	4.8.36
Watling Island	... ...	The Keepers	... ...	Lighthouse Register	... ...	Lighthouse Register 1.1.36 to 30.6.36	5.8.36
Cape Pembroke (Falkland Is.)	... ...	,, ,,	... ...	,,	... ...	,, ,, 1.1.36 to 30.6.36	14.8.36

SHIPS WATER SAMPLING THE NORTH ATLANTIC. FISHERIES LABORATORY, LOWESTOFT.

Name of Vessel.	Captain.	Observing Officer.	Owners.	Received at Government Chemist, London.
Atlantian	E. W. Jones	W. E. Williams	T. & J. Harrison	30 Water Samples, 10.9.36
Dakarian	W. Baird	W. P. Baker	,, ,,	30 ,, ,, 24.7.36
Darian	A. T. Cadogan	S. Richardson	,, ,,	30 ,, ,, 18.8.36
Hilary	L. Evans	H. Sapsworth.	Booth S.S. Co. Ld.	60 ,, ,, 1.11.36

PUBLISHED BY THE AUTHORITY OF THE METEOROLOGICAL COMMITTEE

MARINE METEOROLOGY.

ATLASES :—

Atlantic (North) :—

Atlas of Currents on the Main Trade Routes of the North Atlantic. (No. 323, 1930.) 6*s*. 6*d*. (29¼ × 19½ in.)

Baffin Bay and Davis Strait :—

Monthly Meteorological Charts of Baffin Bay and Davis Strait. (No. 221, 1917.) 8*s*. (30 × 25½ in.)

Indian Ocean :—

Indian Ocean Currents. (No. 392, 1936.) 10*s*. (30 × 20 in.)

Red Sea :—

Meteorological Charts of the Red Sea. (No. 106, 1895.) 21*s*. (22 × 13½ in.)

Southern Ocean :—

Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. (No. 123, 1917.) 7*s*. 6*d*. (12½ × 9½ in.)

BOOKS :—

A Handbook of Weather, Currents and Ice, for Seamen. (No. 379, 1935.) 4*s*. (8vo.)

The Marine Observer's Handbook. Sixth Edition. (No. 218, 1937.) (8vo.) Will be published shortly.

Decode for use with the International Code for Wireless Weather Messages from Ships, with notes for the guidance of masters of British ships for making Weather Reports. Fourth Edition. (No. 329, 1936.) (8vo.) 6*d*.

JOURNAL :—

The Marine Observer.

The quarterly review of the Marine Division of the Meteorological Office in co-operation with Voluntary Marine Observers; with monthly supplements.

Deals with Weather, Climate, Currents and Ice as they are met in daily life at sea :—

Quarterly numbers 4*s*. net, 3*d*. postage; Monthly Supplements 6*d*. each net, 1*d*. postage.

Annual Subscription (including Supplements) 21*s*., post free.
Cover for Volume 2*s*. net, 4*d*. postage.

The Publications in this list can be purchased directly from
H.M. Stationery Office at the following addresses :—
Adastral House, Kingsway, London, W.C.2; 120 George Street, Edinburgh 2; 26 York Street, Manchester 1;
1 St. Andrew's Crescent, Cardiff; 80 Chichester Street, Belfast;
or through any bookseller

Printed under the authority of His Majesty's Stationery Office
By Eyre and Spottiswoode Limited, East Harding Street, E.C.4
Printers to the King's Most Excellent Majesty

w (375)15559 Wt 18—22 975 12/36 (Item 6)

MARINE METEOROLOGY

Books Published by the Authority of the Meteorological Committee,
Air Ministry, London

A HANDBOOK OF WEATHER, CURRENTS AND ICE, FOR SEAMEN

Published on March 1st, 1935

THIS book has been recently written by the Marine Superintendent of the Meteorological Office to replace obsolete text books.

It is intended mainly for the great majority of the navigating officers of the merchant navy who do not receive information regularly through the medium of the "Marine Observer."

In this small volume, in language simple to seamen, is compressed as much of the information as is most desirable for seamen, that can be now given with confidence.

About the air and the sea, the wind systems of the oceans, tropical revolving storms and rules for handling ships in them; weather in middle and high latitudes, and how to forecast it; the currents of the oceans; floating ice, that obstacle harder than salt water which has been responsible for the end of many a fine ship, with a chapter upon modern ocean pilotage. An appendix gives the necessary Tables for reducing the barometer readings to the standard datum, and the international scales and notations for use at sea.

Marginal notes for ready reference are given throughout the book, with a good index, and there are 34 illustrations.

(*M.O.* 379.) 4*s.* (4*s.* 4*d.*)

DECODE
for use with the
INTERNATIONAL CODE
for
WIRELESS WEATHER MESSAGES FROM SHIPS

4th edition. Revised to 1st October, 1936

NOW includes a fuller description of the Selected Ship system, schedule for communication, tables for coding and decoding weather reports, and notes for the guidance of the masters of British ships which are not Selected Ships.

This pamphlet has been recommended to the owners of all ships fitted with W.T., registered in Great Britain and Northern Ireland.

With it, reports made by Selected Ships of all nations may be decoded.

(*M.O.* 329.) 6*d.* (7*d.*)

MARINE OBSERVER'S HANDBOOK

THE sixth edition of this book will be published shortly.

This book has been rewritten as a companion to "A Handbook of Weather, Currents and Ice for Seamen," and also as a guide to the Voluntary System of Marine Meteorological Observation of the British Meteorological Office.

(M.O. 218.)

All prices are net, those in brackets include postage.

Obtainable from

HIS MAJESTY'S STATIONERY OFFICE

LONDON: Adastral House, Kingsway, W.C.2
EDINBURGH 2: 120 George Street
MANCHESTER 1: 26 York Street
CARDIFF: 1 St. Andrew's Crescent
BELFAST: 80 Chichester Street
Or through any bookseller

S.O. Code No. 40-38-1-37